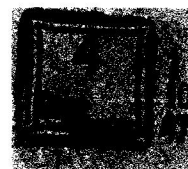


WAR DEPARTMENT TECHNICAL MANUAL



SHOE REPAIR MACHINES

(LANDIS AND AMERICAN)



WAR DEPARTMENT · OCTOBER 1946

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The usual patent search is recommended before
practical applications.

FOREWORD

The instructions in this manual are published for the information and guidance of the personnel to whom the hoe repair equipment is assigned. They contain information on the operation, maintenance, and repair of the titching, finishing, combination ole cutter and kifer, and patching machine, and on the hoe repair trailer itself. Each major unit of equipment is described and its function in relation to the other components is explained.

The manual is divided into five books which cover the following equipment:

Book 1- TITCHING MACHINE (American Models B, C, and CA, and Landi (No. 12 Model F and K).

Book 2- FINISHING MACHINE (American Model L, and Landi 100 Line Model 102).

Book 3- OLE CUTTER AND KIVER MACHINE (American Model B, and Landi).

Book 4- PATCHING MACHINE (American Models 29K5, 29K60, 29K62, and 29K70).

Book 5- TRAILER, T.Y.O.-HEEL, HOE REPAIR.

The instructions in each of the five books are arranged in five parts as follows:

Part One, Introduction.

Part Two, Operating Instructions.

Part Three, Maintenance Instructions.

Part Four, Assembly.

Part Five, Repair Instructions.

Information on the storage and shipment of the equipment, and pertinent reference such as applicable supply catalogs, Technical Manual, manufacturer's manuals, and Film strips will be found in the appendices.

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BOOK I

STITCHING MACHINE

Landis No. 12 models F and K

American models B, C, and CA

PART ONE

INTRODUCTION

Section I. GENERAL

I. Scope

The instructions in book I apply to the Stitching Machine, Landis No. 12 Models F and K and American Models B, C, and CA. Each of the five models is a curved needle and awl sole stitcher designed to sew the outsole to welted soles.

a Part two contains information on the operation of the stitching machine and a description of its controls and instruments.

b Part three contains information for the guidance of the personnel of using organizations responsible for the first and second echelon maintenance of the stitching machine. It contains information needed for the scheduled lubrication and preventive maintenance service. Paragraphs 52 through 71 are devoted to second echelon maintenance for the various assemblies and major units which comprise the Landis No. 12 Model K Stitcher. They contain short descriptions of the components as well as explanations of the purpose, functioning, and interrelationship of systems in the equipment. These sections contain description, removal, adjustment, and installation of unit. Only the maintenance which the unit mechanic of the using organization is authorized to perform is included.

c Part five contains instructions for the information and guidance of personnel responsible for third and higher echelon maintenance of the stitching machine. It contains maintenance information which is beyond the scope of the tools, equipment, and supplies normally available to using organizations. Details of motor maintenance are given in TM 9-1825A.

2. Requisitioning Information

Tools, spare parts, and supplies should always be requisitioned by Federal stock number and standard nomenclature when these are indicated. If no Federal stock number is shown, requisition is by vendor's part number and nomenclature. When ordering spare parts, give the serial number of the machine in addition to the vendor's part number

and nomenclature.

3. Records

a WD AGO FORM 460 (PREVENTIVE MAINTENANCE ROSTER). The parts of this form which apply to stitching machines may be maintained to record the lubrication of this equipment, as described in paragraphs 44 and 45.

b WD AGO FORM 468 (UNSATISFACTORY EQUIPMENT REPORT). This form will be used to report defects in the manufacturing, design, or operation of machines, assemblies, or parts. The same form will be used to report complaints on the lubricants and preserving materials used in the machines. When so used, the form will contain identifying details of the products and machinery on which they are used.

4. Orientation

a Throughout this book the terms FRONT, REAR, LEFT and RIGHT are used as the operator standing at the controls of the stitcher in the operating position would use them.

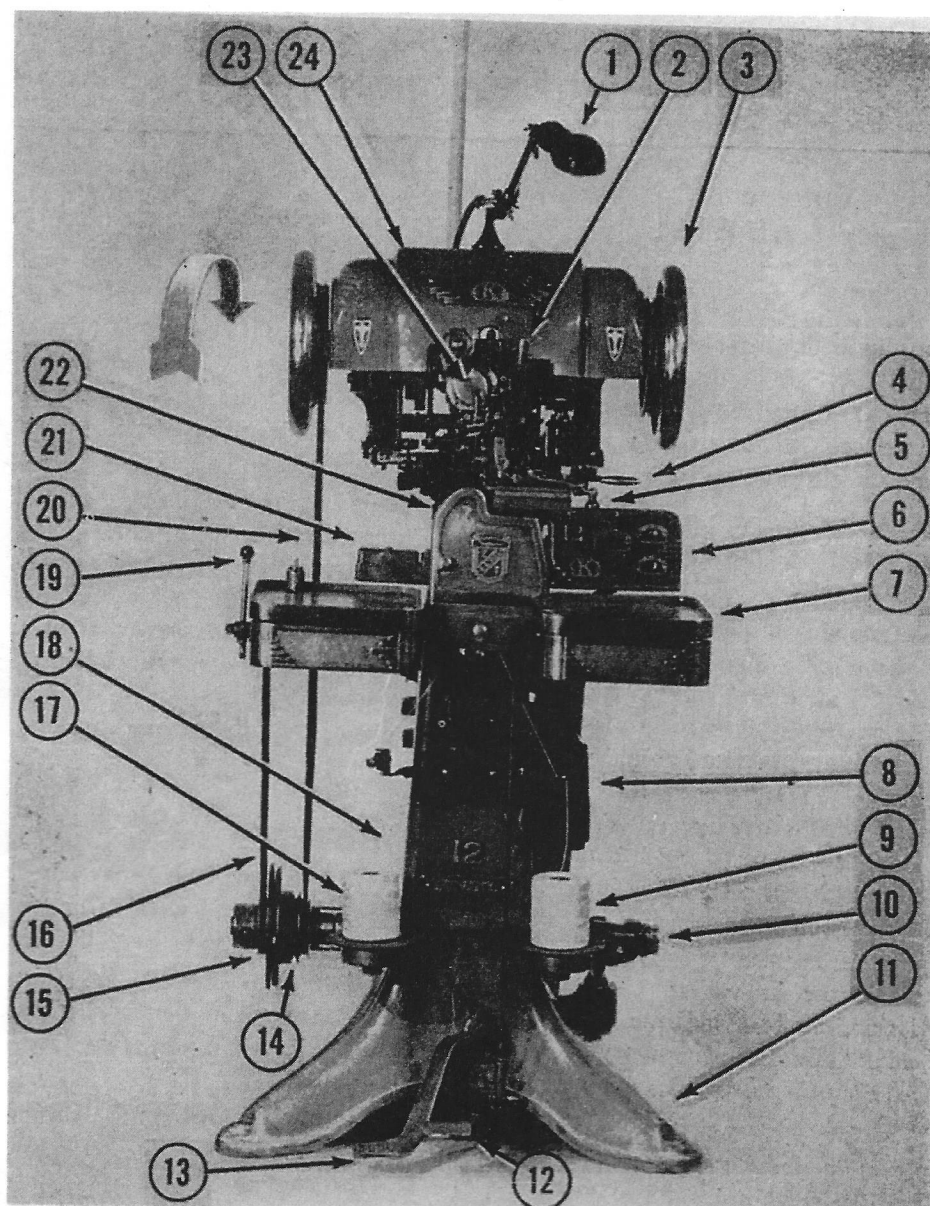
b The cams in the stitcher head are numbered from the left: No. one, two, three, and four.

Section II. DESCRIPTION AND DATA

5. Description

a GENERAL. The five models included in this book are fundamentally alike. Any one of them may be found in the van type shoe repair trailers or in fixed repair installations. However, the Landis No. 12 model K (fig. 1) is the model most commonly used. This model is standard in filling the stitcher requirements of the Army. This machine is also in the Landis portable shoe repair unit (fig.

4) which is installed in the two-wheel shoe repair trailer. For that reason, the text of this book is based on the Landis No. 12 model K Stitcher. Specific reference to the maintenance and operation of the other four models of stitchers will be made only when applicable instructions differ from those prescribed for the model K Stitcher.



Ref. No.	Nomenclature	Ref. No.	Nomenclature
1	Lamp.	13	Power treadle.
2	Presserfoot lever.	14	Power belt wheel.
3	Handwheel.	15	Power friction wheel.
4	Feed and guide handle.	16	Bobbin winder belt.
5	Shoe guide shifter handle.	17	Bobbin thread.
6	Control panel.	18	Stand column.
7	Tool shelf.	19	Bobbin winder shifter handle.
8	Motor control.	20	Power drive belt.
9	Needle thread.	21	Bobbin oven.
10	Power shaft.	22	Heat guard.
11	Standard base.	23	Shuttle.
12	Presserfoot treadle.	24	Cam cover.

Figure 1. Landis Nu. 12 model K sole stitcher.

b IDENTIFICATION. The operator should be able to identify his machine completely. The name and model letter of the American models B, C, and CA appear on the front of the stitcher head cover. The serial number of the machine is shown on the metal plate at the top of the control panel. (See fig. 3.) The name and the model number and letter of the Landis machines is found on the stitcher head cover and on the control panel. The serial number appears on the metal plate fastened on the base of the stitcher head directly beneath cam 10. two. Accurate identification of the machine is especially important in ordering replacement parts.

c DIFFERENCES IN MODELS. The five models are basically alike, but they are different to the extent that the models developed most recently contain some improvements not found on the others.

(1) *Landis model F.* This model (fig. 2) was

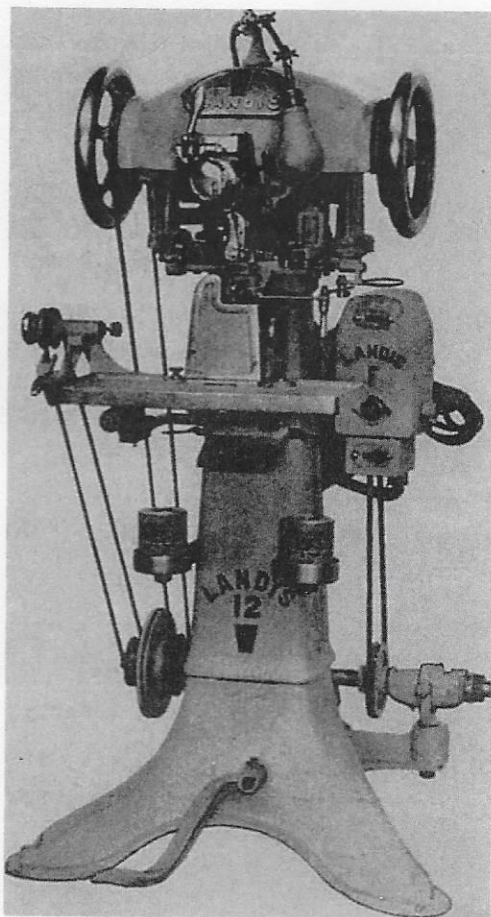


Figure 2. Landis No. 12 model F sole stitcher.

the first of the two Landis models to be used by the Army. The presserfoot lift is hand-operated and the presserfoot has a ratchet lock. It has no manual release on the thread lock. The first model F stitchers have a rheostat temperature control for the use of hard wax, but later models of this stitcher have the same thermostatic heat control as that used on the Landis model K.

(2) *Landis model K.* On the model K (fig. 1) the presserfoot can be released and raised with a foot-operated control. This operation simultaneously releases the thread lock. The lock on the presserfoot of the model K is a multi-thread screw and nut. Operating temperature of the wax- and thread-handling mechanisms is automatically controlled by a Vibrite-Rogers hydraulic diaphragm switch thermostat. The K has a front thread lock and carries heavy tension. When the thread must be pulled manually, both lock and tension can be released by operating the foot control. The heating elements on models K and F are alike, but are different from the heating elements on the American models. Models K and F have four flat, conduction type heat units which total 260 watts. One is clamped to the shuttle head, one to the wax pot (heat plate), one to the take-up (heat plate), and one to the bobbin winder.

(3) *American model B.* The model B (fig. 3) is one of the earlier American models. The presserfoot lift is hand operated and the presserfoot has a ratchet lock. The thread lock does not have a manual release. Operating heat temperature is controlled by a rheostat. Later models of the model B stitcher have the same thermostatic heat control used on the American models C and CA. The heating elements used on this stitcher are the same as those used on models C and CA. The stitcher has four heating elements, each 1 1/2 inch in diameter, supplying a total heating capacity of 300 watts. The heating units are inserted in 1 1/2-inch holes in the machine parts that are to be heated. One is placed in the shuttle head and the other three go into the heat plate.

(4) *American models C and CA.* In these models the operating heat is controlled by a Minneapolis-Honeywell mercury tube and bimetal coil thermostat. The presserfoot is released and raised with a foot-operated control. Operation of that control simultaneously releases the thread lock. The presserfoot has a ratchet lock. The model C has a double thread lock with two thread lock rolls and a thread meas-

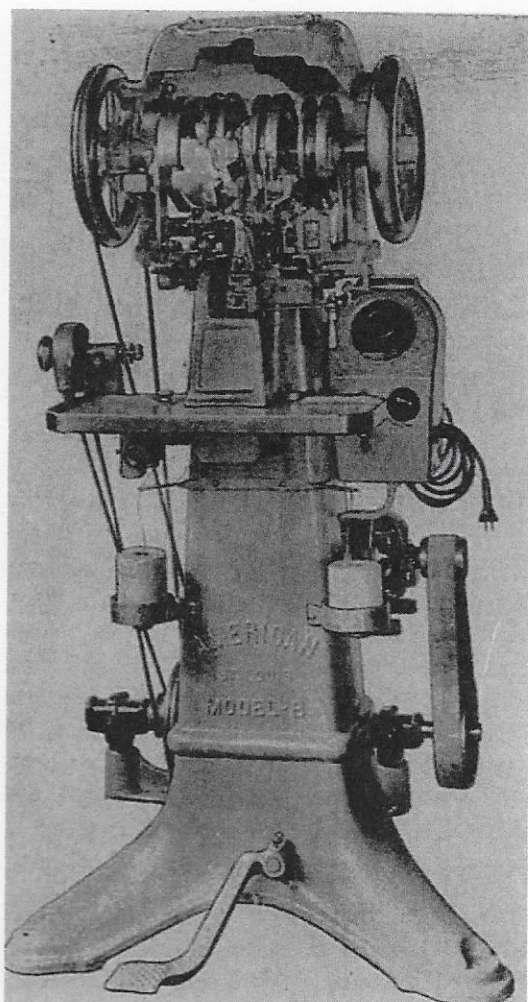


Figure 3. American model B sole stitcher. (Cam cover has been lifted to show operating mechanism of the stitcher head.) American models C and CA (not shown) are similar to this model in appearance.

urer operating between the action of the rolls. The thread lock roll alternately open and close automatically as the thread is measured and the lock is pulled in. In the model C, that design has been changed to one thread lock roll and a tension lock. The tension lock is set with a moderate tension that yields readily to pulling of the thread. It is locked only when the front thread lock is open and is designed to prevent the take-up from stealing thread when the thread is pulled out of the shuttle. When the thread is pulled out of the shuttle, the front lock is open in order to absorb the thread measured out for the titch.

6. Tabulated Data

a SHIPPING DATA. The shipping data listed

below for the Landi models F and K are not given for the American model B, C, and CA, which are no longer in production. The specifications are for the machines when boxed.

Landi model	Dimensions (in.)		Weight (lbs.)		
	Length	Height	Gross	Tare	Net
F.....	36	64	1,050	490	560
K.....	36	64	1,110	510	600

b PERFORMANCE. (1) Operating speed. The countershaft of these stitchers should be run at a speed of about 600 revolutions per minute. At that speed the camshaft in the head of the titcher will operate at the prescribed speed of 250 to 300 revolutions per minute.

(2) Operating capacity. If the machine is run at the prescribed speed by a skilled operator, and the welts and soles of the shoes are properly prepared for titching, the stitcher will sew 30 to 40 pairs of shoes per hour.

c MOTOR. (1) Single-Unit stitcher. The 10-horsepower, single-phase, 60-cycle, 115 to 230-volt motor with thermal overload protection is standard.

(2) Stitcher-finisher unit. The 12K-100 special unit (fig. 4) used on the two-heel shoe repair trailer contain a 10-horsepower, single-phase, 60-cycle, 110 to 220-volt, 1,750-revolutions-per-minute motor with thermal overload protection.

Section III. TOOLS AND ACCESSORIES

7. Tools

a LANDI MODELS F AND K. The tools for Landi models F and K are shown in figure 5.

b AMERICAN MODELS B, C, AND CA. The tools for American models B, C, and CA are shown in figure 6.

8. Supplies

a LANDI MODELS F AND K. The supplies for Landi model F and K are listed on page 7.

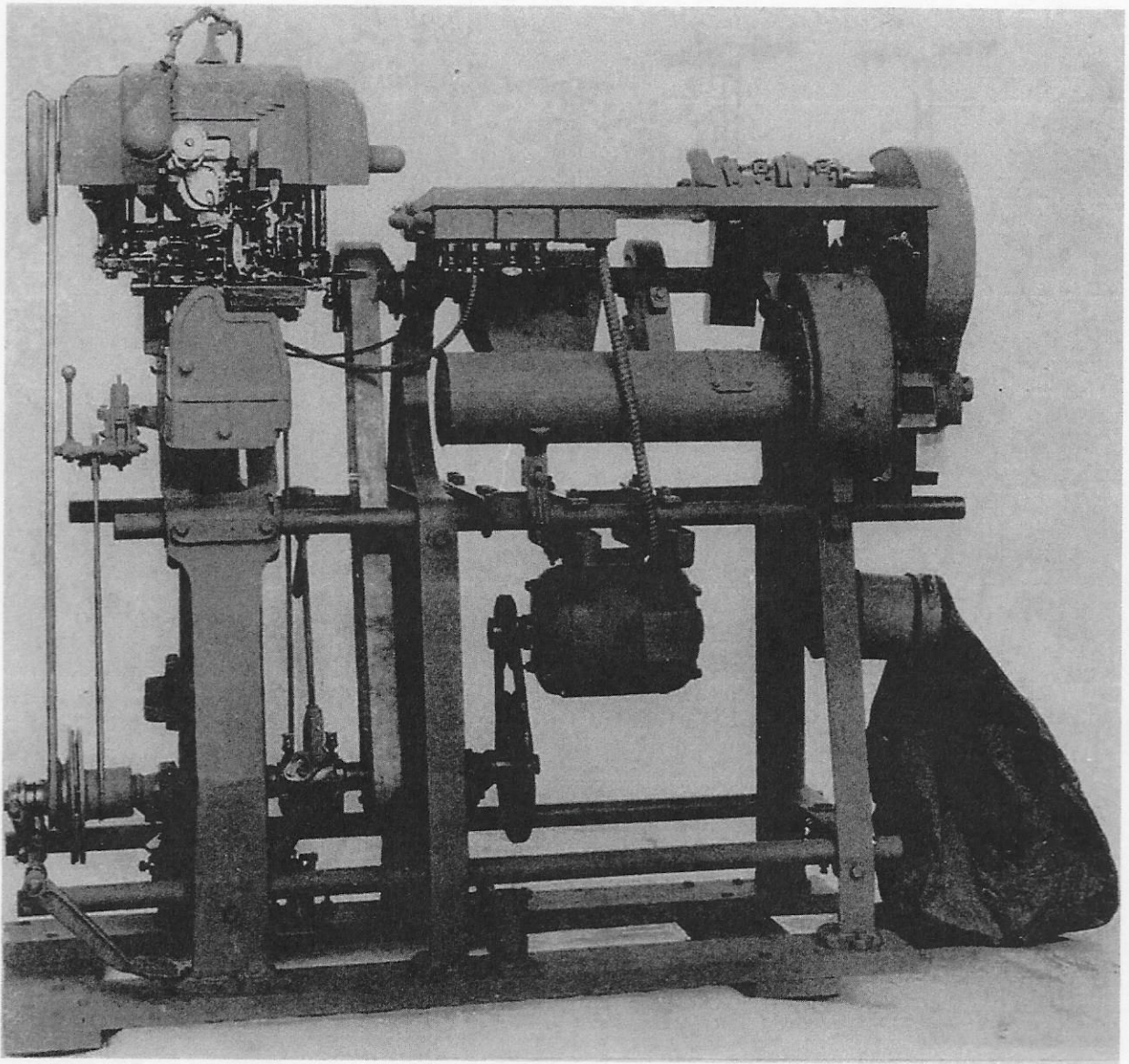
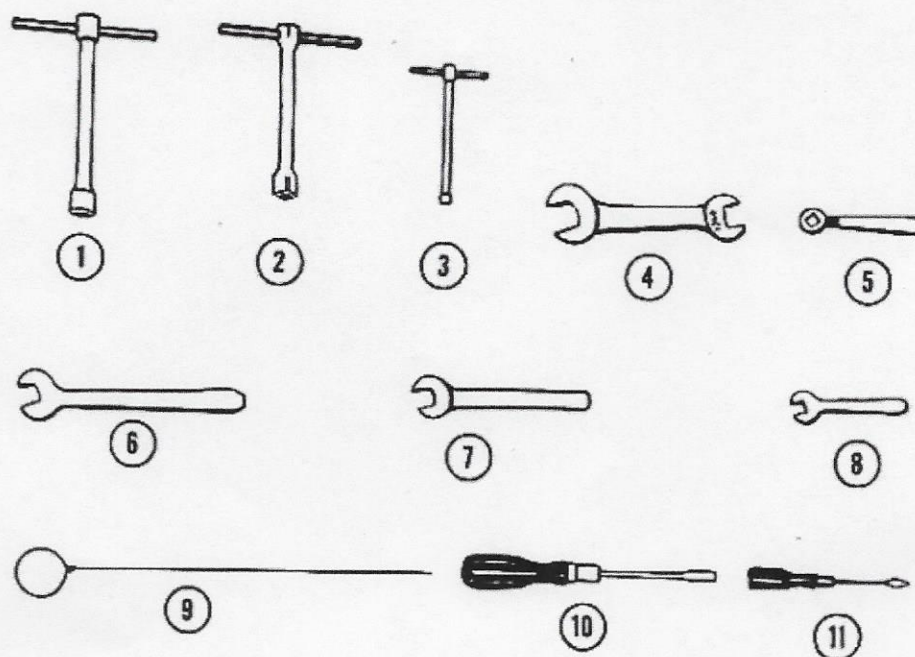
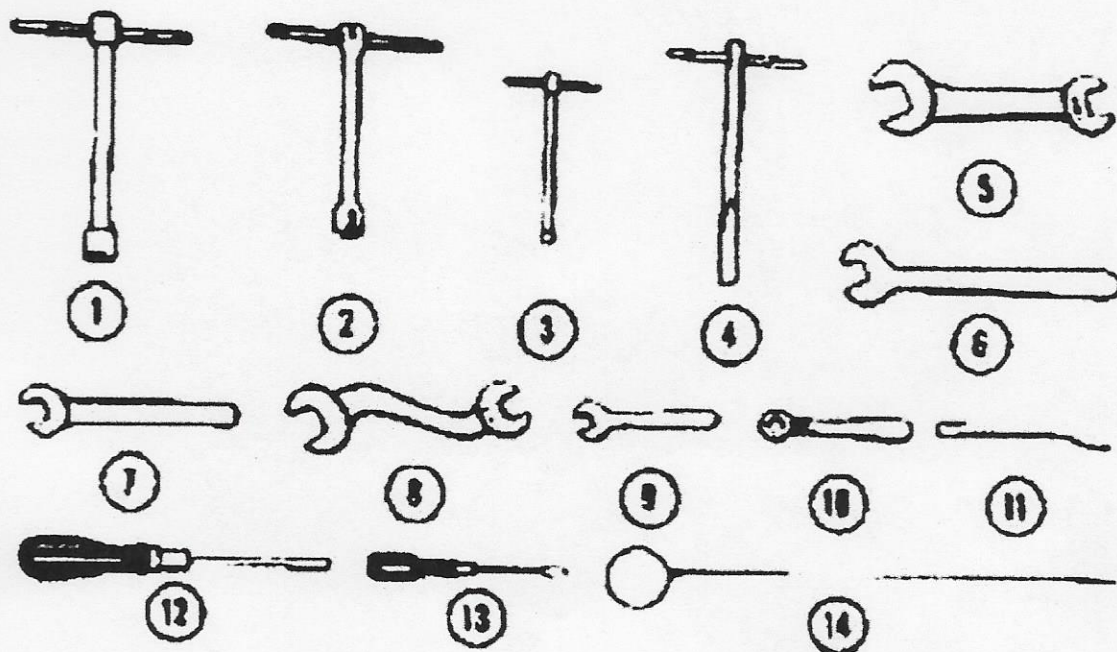


Figure 4. Landis portable shoe repair unit model 12 K-100 special. (Landis No. 12 model K sticher appears at the left of the unit.)



Ref. No.	Vendor's part No.	Nomenclature
1	W-1	Socket wrench for needle and awl clamp 12-24-303AW.
2	W-2	Socket wrench for needle guide screw 12-24-307W.
3	W-7	Socket wrench for looper binding screw 12-29-305W.
4	W-5	Double-end wrench.
5	W-22	Stripper adjusting wrench 12-31-624C.
6	W-18	Wrench for 36-6-307W.
7	W-4	Single-end wrench 12-24-301W.
8		Wrench for needle segment stud setscrew 24-302B.
9	31-913H	Threading wire.
10		Large screw driver.
11		Medium screw driver.

Figure 5. Tools furnished with Landis models F and K.



Ref. No.	Vendor's part No.	Nonienclatire
1	B-14-1.....	3/8-inch square socket wrench.
2	B-14-2.....	S/16-inch square socket wrench.
3	B-14-3.....	9/64-inch square socket wrench.
4	B-14-11.....	T-handle screw driver.
5	B-14-4.....	S/8-inch and 3/4-inch double-end wrench.
6	B-14-S.....	9/16-inch single-end wrench.
7	B-14-6.....	1/2-inch single-end wrench.
8	B-14-7.....	1/2-inch and 11/16-inch S wrench.
9	B-14-8.....	S/16-inch open-end wrench.
10	B-14-9.....	S/16-inch box wrench.
11	B-14-10.....	Pin wrench.
12	B-14-12.....	3-inch screw driver.
13	B-14-13.....	Bobbin case screw driver.
14	B-14-14.....	Threading hook.

Figure 6. Tools furnished with American models B, C, and CA.

Supply list

Vendor's part No.	Name	No. furnished
	No. 22 needles.....	12
	No. 22 awls.....	12
	No. 23 awls.....	12
K2S-6.....	Bobbins.....	2
24-308.....	Needle plate screw.....	1
24-307.....	Needle guide screws.....	2
31-908E.....	Rubber strippers.....	2
23-209.....	Cam cover studs.....	2
23-90SB.....	Round belt hooks.....	3
	Lag screws.....	3
12G 31-43.....	Electric lamp.....	
12G 31-54B.....	Lamp shade.....	1
	Stitcher oil.....	11
	white wax.....	•1

1 Quart.

• Pound.

(Additional operating supplies issued to the organization may be found in par. 42.)

b. AMERICAN MODELS B, C, AND CA. The supplies for American models B, C, and CA are listed below:

Supply list

Vendor's part No.	Name	No. furnished
	No. 50 needles.....	12
	No. 47 awls.....	12
B-3-8...	Bobbin.....	1
B-4-7C..	No. 50 needle guide.....	1
B-4-7G..	Needle guide fastening screw.....	2
B-6-6...	Long lip presserfoot.....	1
B-6-3E..	Presserfoot fastening screw.....	1
B-4-8B..	Wode table screw.....	1
B-11-2D	Shoe guard.....	
B-13-7..	SO-watt lamp (for 110-volt machine) or	
B-13-S..	SO-watt lamp (for 220-volt machine) Machine oil.....	1 11
	Wax.....	•1

1 Quart.

• Pound.

PART TWO

OPERATING INSTRUCTIONS

Section IV. SERVICE UPON RECEIPT OF EQUIPMENT

9. New Equipment

a INSPECTION FOR DAMAGE I SHIPMENT.

When the stitcher arrives in its crate or package, check to see that the packing brace is still in place across the cam posts of the machine. If that brace is intact when the machine is uncrated, it is unlikely that any part of the stitcher has been damaged in shipment. If the supporting brace is loose and the stitcher has moved in the crate, check the exposed parts at the front of the head and the countershaft mounting at the rear of the base of the machine.

b REMOVAL OF CORROSION-PREVENTIVE MATERIAL. The machined parts of the stitcher not protected by a coat of paint are covered with a slushing grease when the machine is shipped. Remove the protective coating of grease and clean the operating parts of the machine thoroughly. The cleaning of the cams and cam races should be given special attention, because their wearing surfaces are easily damaged by the scouring action of dirt and grit. A mixture of Diesel fuel and machine oil makes a good flushing solution to use in the initial cleaning of the stitcher. The solution should not contain more than 15 percent machine oil.

c INSTALLATION. (1) *Motor drive.* When a stitcher is equipped with motor, its installation is independent of the location of the finisher. The stitcher should be set up in a position that fits well into the normal flow of work from the jacks. It should be anchored to the floor if possible. When using a 2-inch power belt, a 3-inch pulley should be used on the motor, and an 8-inch pulley should be used on the countershaft. Y-belt operation requires a 3½-inch motor pulley and a 9-inch countershaft pulley. When the belts are in place, see that the voltage of the stitcher motor and heating elements corresponds to the voltage of the power line to be used.

(2) *Finisher drive.* When the stitcher is to be driven from a finisher, the stitcher countershaft should be at least 6 inches to the rear of the finisher countershaft. The stitcher countershaft should run at a speed of 600 revolutions per minute in order to give the stitcher a speed of 250 to 300 revolutions per minute. A straight belt is used between the finisher and the stitcher, so that the stitcher countershaft will run in the same direction as the finisher countershaft. The round driving belts are crossed so that the top of the handwheel will turn to the rear.

(3) *Landis 12K-100 special unit.* A stitcher and a finisher are combined in this unit and are mounted on a common base. The unit is used in the two-wheel shoe repair trailer. Installation is complete when the unit is unloaded and placed on level ground or flooring and the power lead is plugged into a duplex outlet in the power line. (See fig. 4.)

d RuN-IN TEST. After the machine is installed, turn the handwheel slowly. It should turn smoothly without binding in the camshaft bearings or the cam races. As the wheel turns, check the position of theawl and needle and check to see that the relative positions of the needle, looper, lifter, and presser-foot are correct. If the machine appears to run smoothly during this slow operation, oil the machine, plug in the electric cord, and turn the motor switch on. Block the power treadle down and run the machine for about 4 hours. The machine should not be left running unless an operator is present to stop it at the first sign of mechanical failure. After the run-in test, check the machine again. Make any adjustments that are necessary, as described in paragraphs 56 through 67.

10. Used Equipment

The original service upon the receipt of new equipment also applies to the receipt of used equipment. In addition, check the cam races and camshaft bearings for signs of excessive wear.

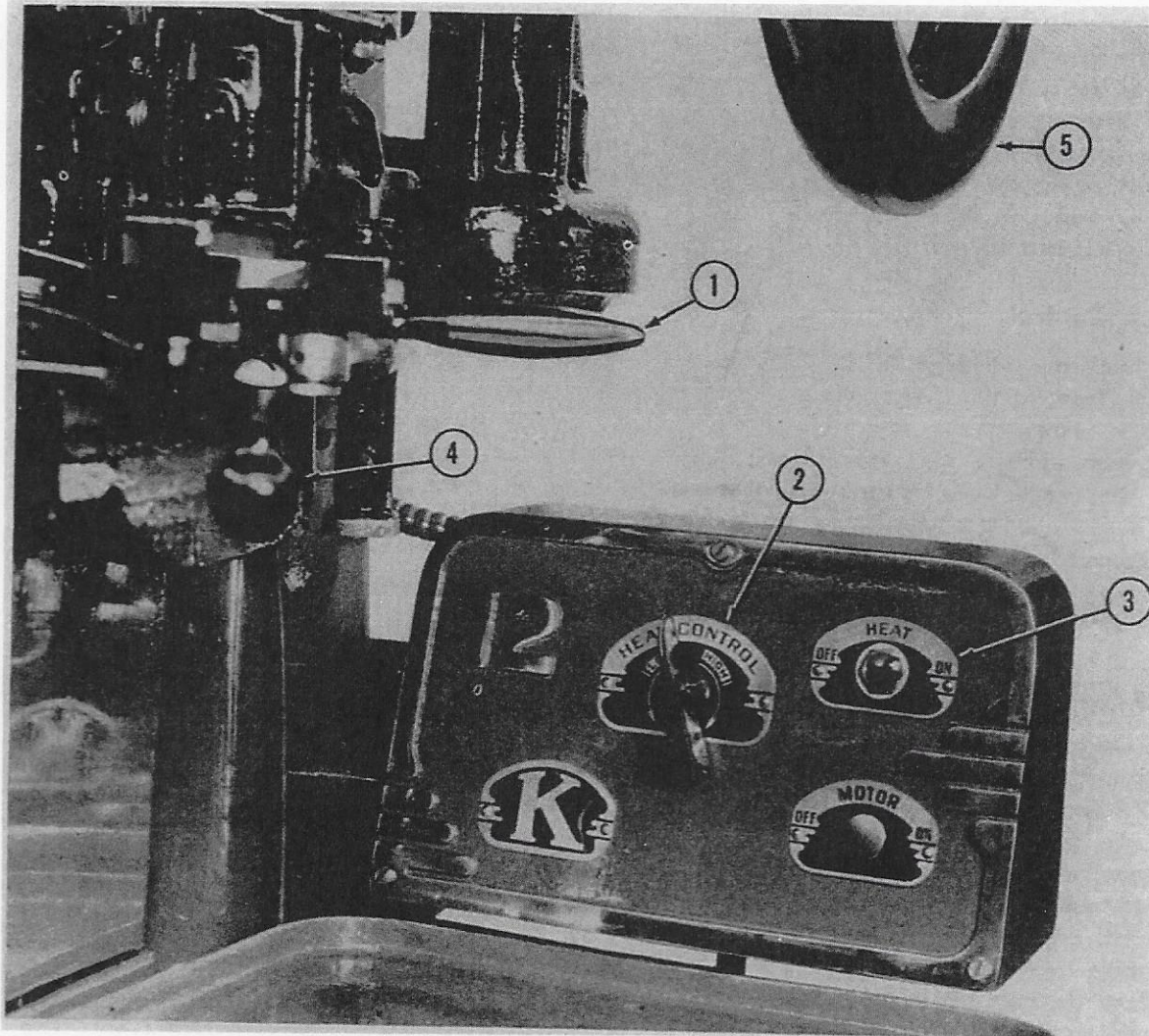
Section V. CONTROLS AND INSTRUMENTS

11. Heat Switch

The heat switch (3, fig. 7) is mounted on the upper right-hand corner of the control panel. The ON and OFF positions are marked plainly on the switch plate. Flip the toggle switch to the right to turn the heat on and flip the switch to the left to turn the heat off.

12. Heat Control

The heat control (2, fig. 7) is located on the top center of the control panel. When the heat has been turned on, the heat control allows the operator to regulate, between HIGH and LOW positions, the amount of current that goes into the heating elements of the machine. HIGH and LOW are plainly indicated on the heat control plate. Turn the indicator to the left as far as it will go to set the heat control at LOW. The LOW position is used to hold the temperature up during brief pauses in



Ref.
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- 1 Feed and guide handle.
- 2 Heat control.
- 3 Heat switch.
- 4 hoe guide shifter handle.
- 5 Handwheel.

Figure 7. Controls (Landis model K).

operation. When more heat is desired, turn the indicator to the right until the proper amount of heat is being delivered to the machine. To get the greatest amount of heat that the heating elements can deliver, turn the indicator to the right as far as it will go, to the HIGH position. The HIGH position is used to warm up the machine before operation begins, and it may be used during operation in cold operating conditions.

13. Motor Control

The motor control switch (8, fig. 1) is no longer found on the control panel even though a plate for the switch may still be seen on the control panel. In order to use a switch with a thermal overload protection, the switch is mounted as a separate unit. It is located underneath the tool tray on the right-hand side of the support column. To start the motor, press the top button in the switch box. To stop the motor, press the bottom button.

14. Stitch Control

The feed and guide handle (1, fig. 7) is located at the right front of the base of the stitcher head. This handle allows the operator to regulate the length of each stitch as it is sewed in the sole of the shoe. The handle has a forward and a rear position, but it can be set at intermediate points between those positions. To lengthen the stitch, pull the lever forward. To shorten the stitch, push the lever to the rear of the machine.

15. Shoe Guide

The shoe guide is located in the center of the face of the stitcher head. The shoe guide shifter handle (4, fig. 7) that regulates it is located at the right front of the base of the stitcher head. The shoe guide determines how far from the edge of the sole the stitches will be made. To bring the stitching nearer to the edge of the sole, pull the shoe guide shifter handle forward. To move the stitching farther in from the edge of the sole, push the shifter handle to the rear of the machine.

16. Presserfoot Treadle

The presserfoot treadle (12, fig. 1) is located at the right front of the base of the stand. The presserfoot is located above the work table in the center of the face of the stitcher head. It holds the welt

and the sole down on the work table during the stitching operation. When the operator steps on the presserfoot treadle, he raises the presserfoot and releases the thread lock and the thread tension. Removing the pressure from the presserfoot treadle lowers the presserfoot and reestablishes the tension and the lock on the thread.

17. Power Treadle

The power treadle is located at the left front of the base of the stand. (See 13, fig. 1.) Stepping on the treadle engages the clutch on the power shaft at the rear of the machine, activating the power belt wheel and setting the stitcher head in motion. Increasing the pressure on the treadle increases the speed of the stitcher until the treadle is at its bottom position and the stitcher is running at top speed. Releasing the treadle disengages the clutch and causes the stitcher to come to a stop.

18. Presserfoot Lever

The presserfoot lever (2, fig. 1) is the hand control for the presserfoot. It is located in the center of the face of the stitcher head. It may be used when the spring in the presserfoot treadle linkage fails to pull the presserfoot completely down on the work when the treadle is released. To raise the presserfoot, pull the presserfoot lever up and to the rear of the machine. To lower the presserfoot, pull the lever forward and down.

19. Bobbin Winder Shifter Handle

The bobbin winder is located at the rear of the left-hand tool shelf. The bobbin winder shifter handle (19, fig. 1) starts and stops the bobbin winder. To start the bobbin winder, pull the shifter handle forward. To stop the bobbin winder, push the handle toward the rear of the machine.

20. Handwheel

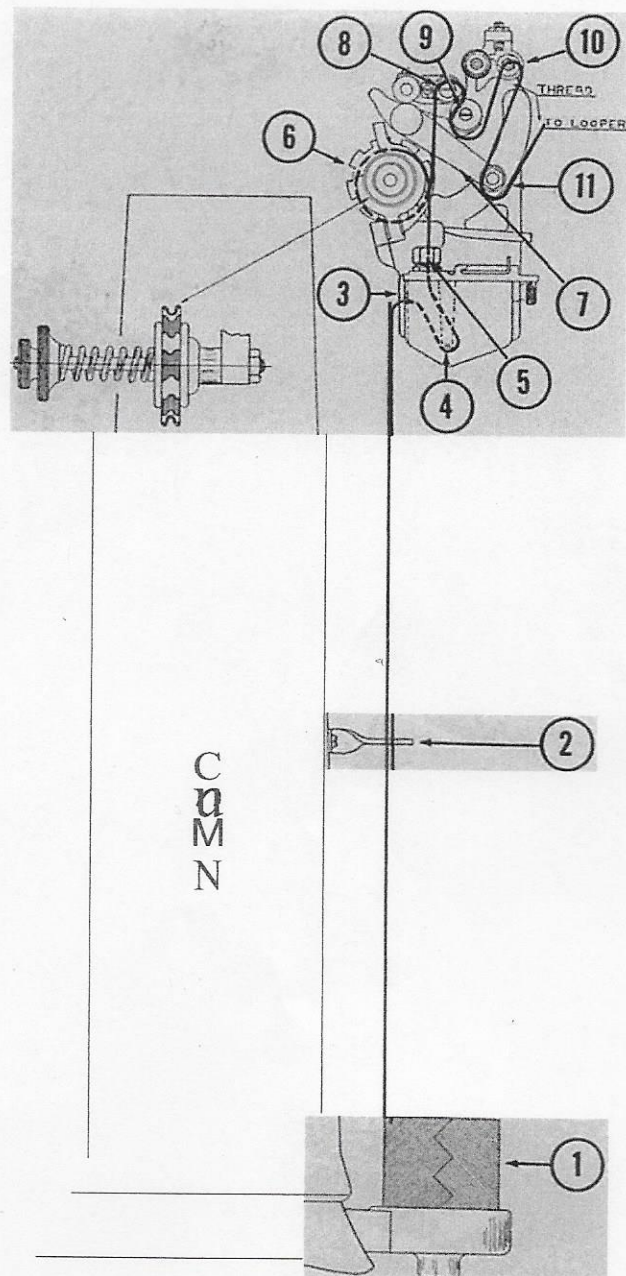
The handwheel at the right side of the stitcher head is used as the control handwheel. (See 3, fig. 1.) To start the machine, grasp the top of the handwheel with the right hand and push it backward and down. Step on the power treadle and the clutch will engage, and the stitcher will be set in motion. To stop the stitcher with the sewing parts in the desired position, release the power treadle and grasp the handwheel. The handwheel is also used, when

the clutch is not engaged, to turn the camshaft slowly to get a certain desired alignment of the parts of the stitcher head.

Section VI. OPERATION UNDER USUAL CONDITIONS

2 1 . Threading Machine with Needle Thread (fig. 8.)

- a. Place a spool of thread on the needle thread holder. This thread holder is located on the right side of the front of the column. (See 1, fig. 8.)
- b. Pass the thread up through the hole in the thread guide. The thread guide (2) is located above and to the right of the stitching pool.
- c. Loop the thread over a needle to use the needle as a thread guide. Pass the thread through the hole on the right side of the back of the wax pot (3).
- d. Remove the top of the wax pot.
- e. Pass the thread down through the right hole in the wax fork (4) so that the thread will come up between the forks.
- f. Then pass the thread through the wax stripper (5) that is on top of the wax pot. If the wax stripper is new and tight, it must be disassembled (fig. 9) before the thread can be passed through it. Ordinarily, the threading wire and thread will pass through it without disassembly. If disassembled, pass the threading wire and thread through the rubber stripper, the metal wax pot stripper stud, and the wax pot stripper binding screw, in that order.
- g. Reassemble the stripper. Make sure the wax forks are facing down in the wax pot, then fasten the wax pot top to the wax pot. Pull the thread out above the wax pot about 1 foot.
- h. Place the thread on the tension wheel. (See 6, fig. 8.) Step on the presserfoot treadle to release the tension wheel. Turn the tension wheel up and away until the thread has made one complete turn around the wheel.
- i. Pass the thread up the right side of the thread lock lever (7).
- j. Around the thread-measuring roller (8).
- ii. Down and under the thread lock roller (9).
- l. Up and over the auxiliary take-up roller (10).
- iii. Down to the take-up lever roller (11).
11. Through the eye of the thread looper. (See 1, fig. 10.)
- o. And through the plate. (See 2, fig. 10.)

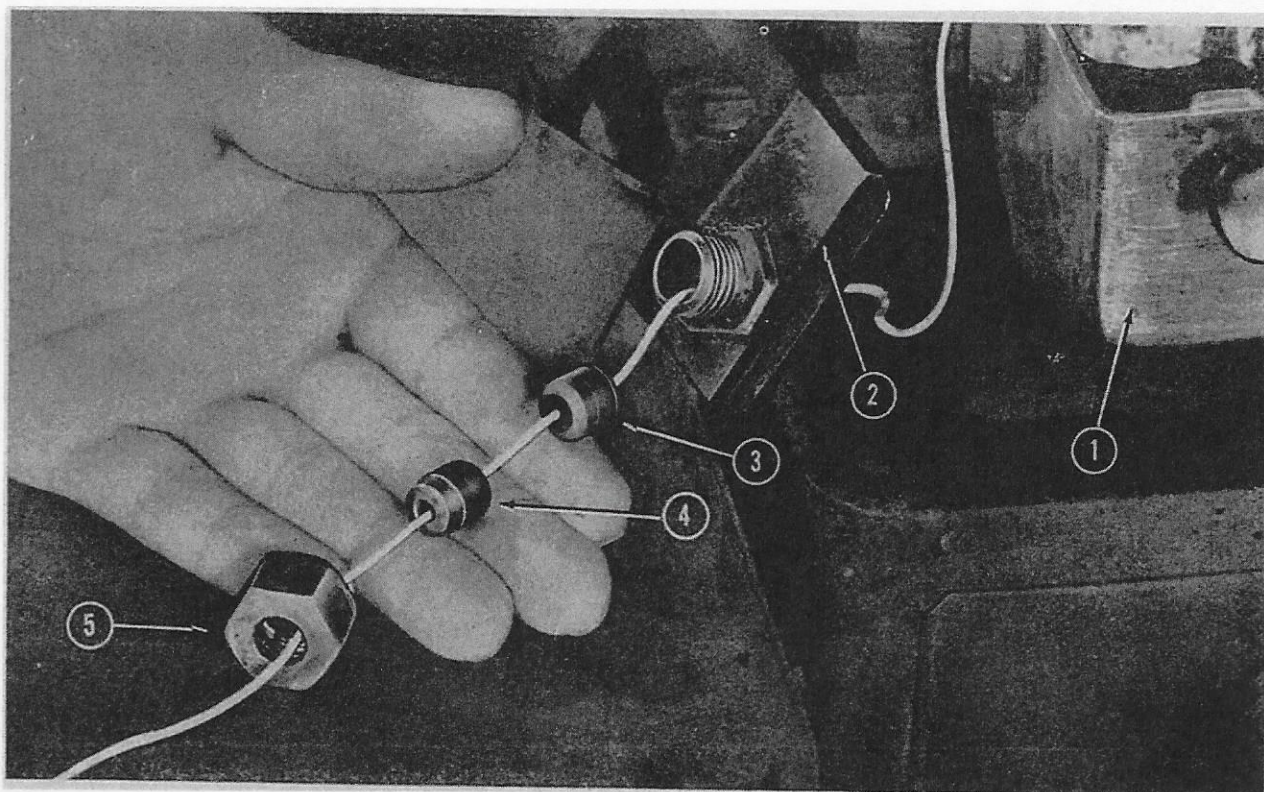


Ref.
No.

Nom.enclature

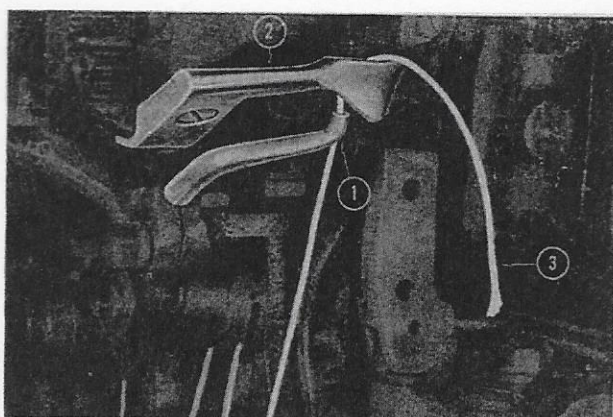
1	Needle thread.
2	Needle thread guide.
3	Thread hole in wax spot.
4	Thread fork.
5	Wax stripper.
6	Tension wheel.
7	Thread Jock lever.
8	Thread-measuring- roller.
9	Thread lock roller.
10	Auxiliary take-up roller.
11	Take-up lever roller.

Figure 8. Threading diagram for needle thread.



Ref. No.	Nomenclature
1	Wax pot.
2	Wax pot lid.
3	Wax pot stripper bushing.
4	Wax pot stripper stud.
5	Wax pot stripper binding nut.

Figure 9. Threadillg disasse111bled wax pot stripper.



Ref. No.	Nomenclature
1	Eye of looper.
2	Needle plate.
3	Needle thread.

Figure 10. Threadillg looper and needle plate.

22. Threading Machine with Bobbin Thread (fig. 11.)

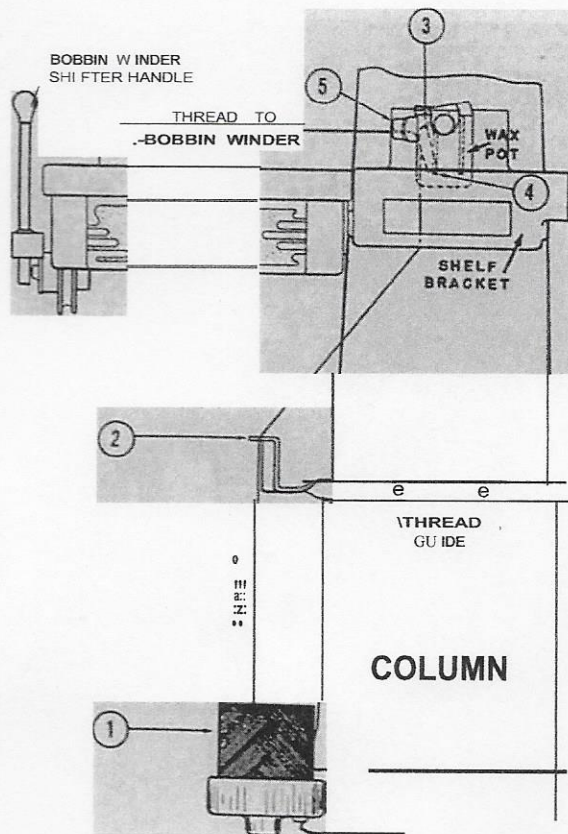
a. Place a spool of thread on the bobbin thread holder. This thread holder is located on the left side of the front of the column. (See 1, fig. 11.)

b. Pass the encl of the thread between tension disks and through the hole in the thread guide (2), which is located directly above the bobbin winder spool.

c. Through the hole in the left side of the back of the wax pot (3).

d. And down through the in ide of the left thread fork. (See 1, fig. 12.)

e. Loosen the tripper binding screw and pass the thread through the str ipper. (See 2, fig. 12.) CviWhen wax is put into the wax pot, the binding screw must be tightened enough to strip excess wax from the thread. See par. 59.)



Ref. No.	Description
1	Bobbin thread.
2	Bobbin thread guide.
3	Thread hole in wax pot.
4	Thread fork.
5	Wax pot stripper.

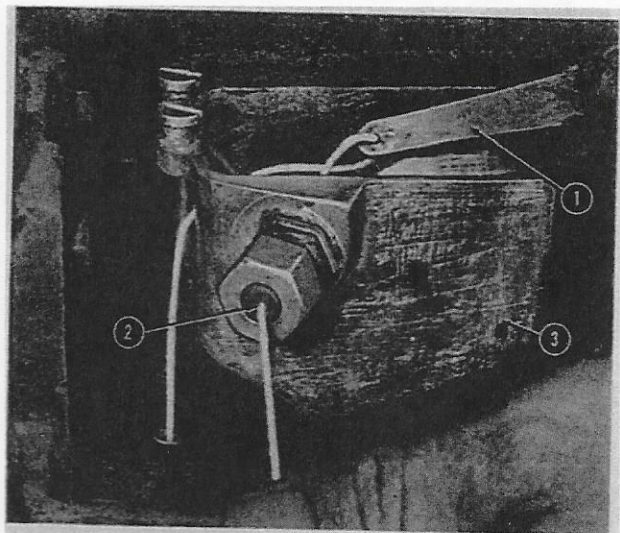
Figure 11 Bobbin thread threading diagram.

23. Wax

Hard wax is used in the wax pot. (See Fig. 9.) Break the wax in small pieces and put it into the wax pot. Do not fill the wax pot with wax. It is easier to control the condition of the wax when the pot is kept half full and fresh wax is added when it is needed. Leave enough wax in the bottom of the pot to melt new wax when it is added. Wax that boils or is heated for any length of time turns black and becomes brittle. Wax in this condition hardens quickly. The waxed thread then becomes stiff and will not lie in the barbs of the needle properly and frequently breaks when it is pulled in the bobbin thread.

24. Heating Machine

a. GENERAL. Heating the machine is one of the most important factors in the successful operation of the titcher. Heated to the right temperature, wax is a lubricant. It will aid in passing the thread easily through the thread-handling mechanisms of the stitcher and through the sole. The wax pot and the thread-handling mechanisms are heated with electrical heating elements. When the titcher is operating, the temperature of the wax in the wax pot should be held at about 190° F. Heating elements at other points on the titcher keep the wax on the thread from cooling too much before the thread is sewed. A thermostat control holds the



Ref. No.	Description
1	Wax pot thread fork.
2	Wax pot stripper.
3	Wax pot.

Figure 12 Threading wax pot thread fork and stripper.

heat at the point chosen on the control panel by the operator.

b. OPERATION. Heat should be turned on at least 30 minutes before titching is begun. To turn the heat on, flip the heat switch in the control panel to ON. (See Fig. 7.) (With an American model, push the button in.) Turn the indicator of the heat control (Fig. 7) toward the HIGH position as far as it will go. The HIGH position will keep the wax at the proper temperature for sewing. The wax is melted enough to sew when the thread can be pulled easily by hand. To keep the machine warm between operation, turn the indicator of the heat control to the LOW position. In the LOW position,

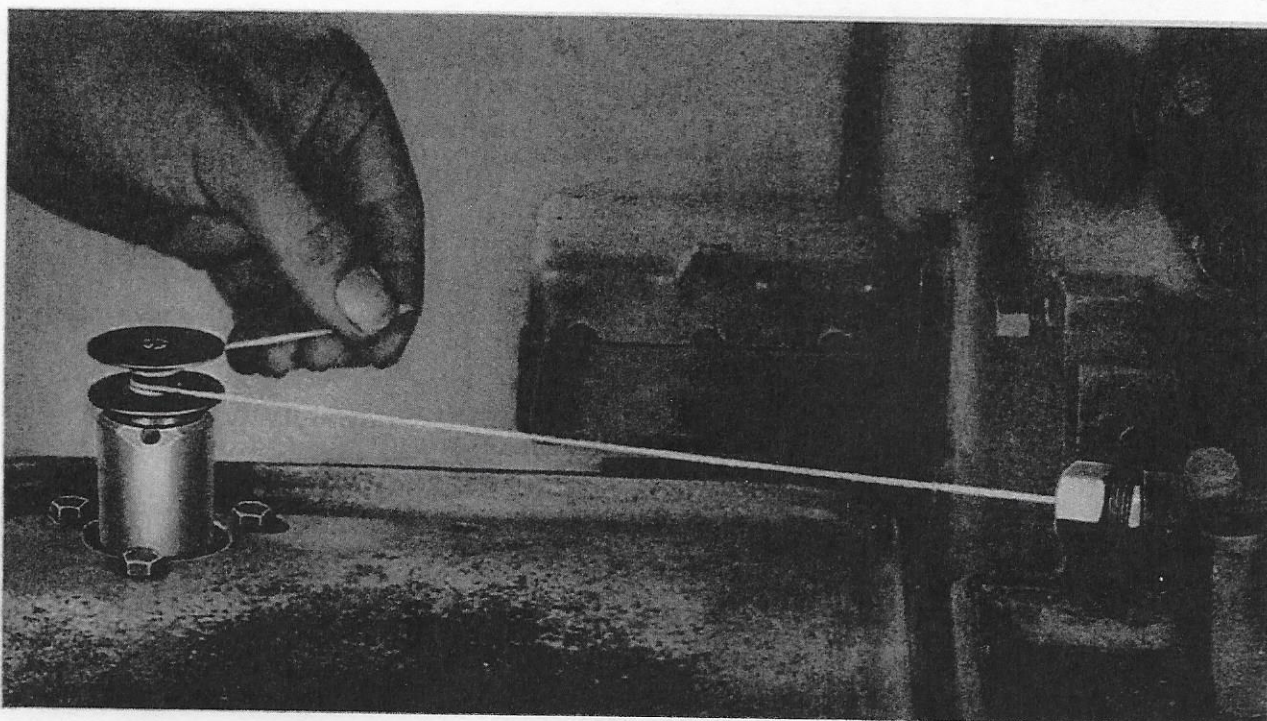


Figure 13. Preparation for winding bobbin.

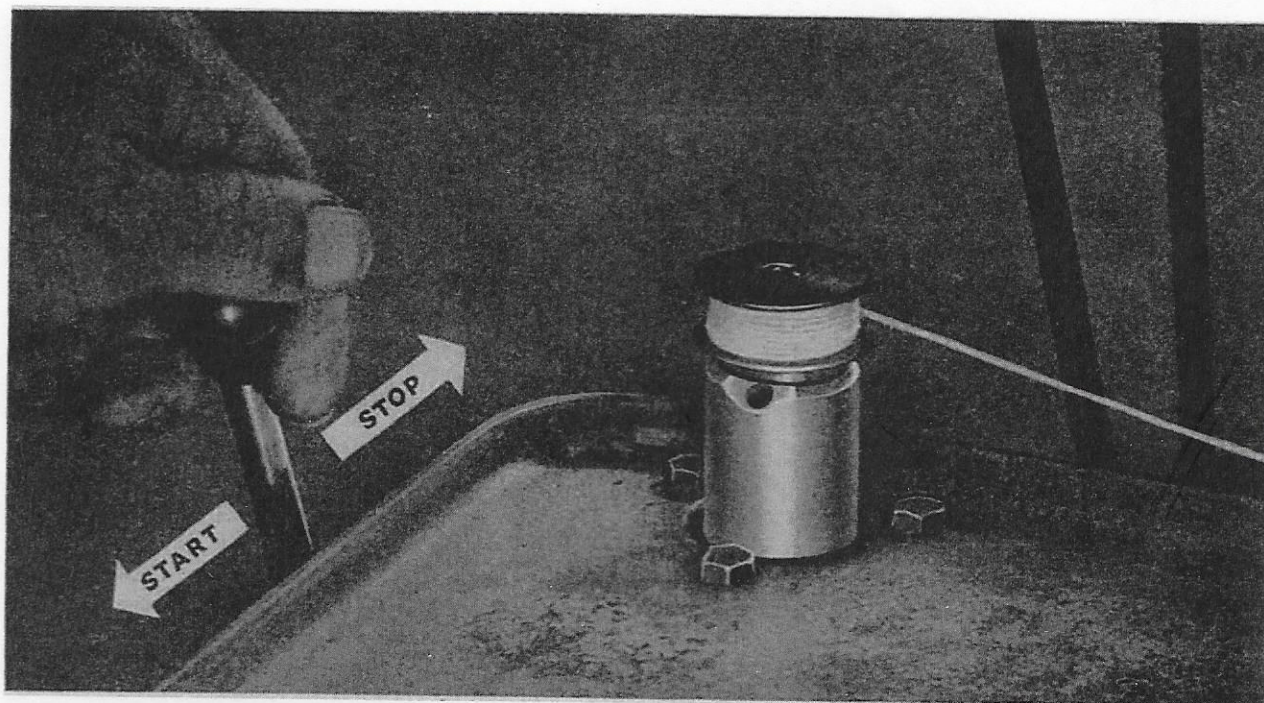


Figure 14. Bobbin winder control

a small amount of current keeps the stitcher from getting cold. The stitcher can be heated to the proper sewing temperature again in 5 to 10 minutes by turning the heat control indicator back to HIGH.

25. Winding Bobbin

a. Pass the thread through the hole in the side of the bobbin until it extends about an inch beyond the bobbin.

b. Place the bobbin on the winder thread side first so that when the bobbin is clamped on the bobbin winder the thread will be held fast. Wind at least three loops of thread around the bobbin by hand so that winding will start easily when the bobbin winder hifter handle is engaged. (See fig. 13.)

c. Start the bobbin winder by pulling the bobbin winder hand lever toward the operator. (See fig. 14.)

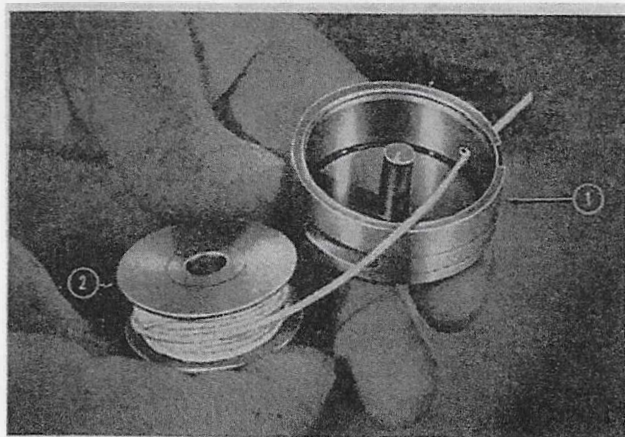
d. Wind the bobbin until the thread is flush with the sides. If the wound thread extends beyond the sides of the bobbin, the bobbin will not fit in the bobbin case.

e. When the bobbin is full, disengage the bobbin winder by pushing the bobbin winder hand lever away from the operator.

f. Cut the thread about 2 inches from the stripper so that enough thread hangs out of the heat guard to start the next bobbin. Remove bobbin from winder.

26. Placing Bobbin in Bobbin Case

a. Pass the cut end of the thread through the hole in the bobbin case. (See fig. 15.)



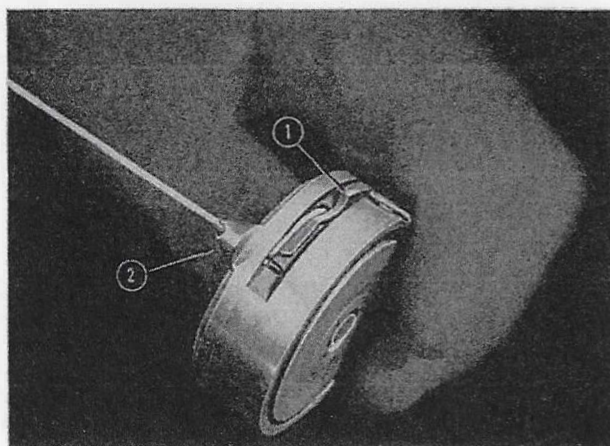
Ref.
No. Nomenclature
1 Bobbin case.
2 Bobbin.

Figure 15. First step in threading bobbin case.

b. Place the bobbin in the case so that the thread will unwind in the opposite direction to that in which it was wound on the bobbin.

c. Pass the thread under the tension spring. (See fig. 16.)

d. And through the horn of the bobbin case. (See fig. 16.)



Ref.
No. Nomenclature
1 Tension spring.
2 Horn of bobbin case

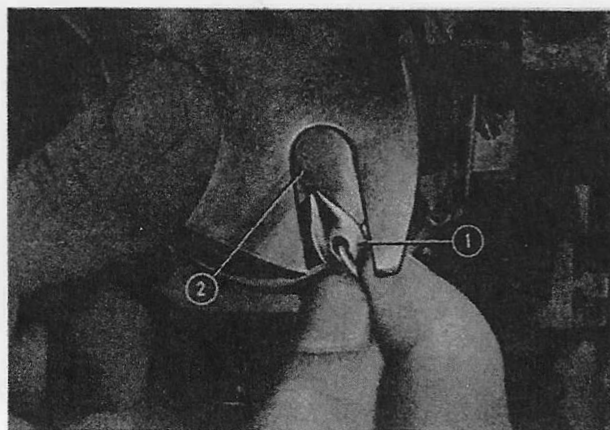
Figure 16. Final step in threading bobbin case.

27. Loading Shuttle (fig. 17.)

a. Lubricate the shuttle as described in paragraphs 4-4 and -1-5.

b. Place the bobbin case in the shuttle so that the horn on the bobbin case (1, fig. 17) will fit into the slit in the cover (2.)

c. Push bobbin case guide down.



Ref.
No. Nomenclature
1 Horn of bobbin case.
2 Slit in shuttle cover.

Figure 17. Proper position of bobbin case in shuttle.

28. Matching Sizes of Needles, Threads, Awls, and Needle Guides

a. The following sizes should be used together:

Needle (No.)	Awl (No.)	Needle guide (No.)	Thread (cord)	Bobbin (line-cord)
45 or 24	43 or 24	45 or 24	10 9	9
47 or 23	45 or 23	47 or 23	8	7
50 or 22	47 or 22	50 or 22	7	6
52 or 21	50 or 21	52 or 21	6	
54 or 20	52 or 20	54 or 20		4

b. The needle guide must be changed when the needle size is changed. The needle guide is stamped with the number of the needle with which it is to be used.

29. Setting Needle

a. The needle is set properly when the barb of the needle is 1/16 inch from the needle guide at the time when the awl is feeding to the left. (See fig. 10.)

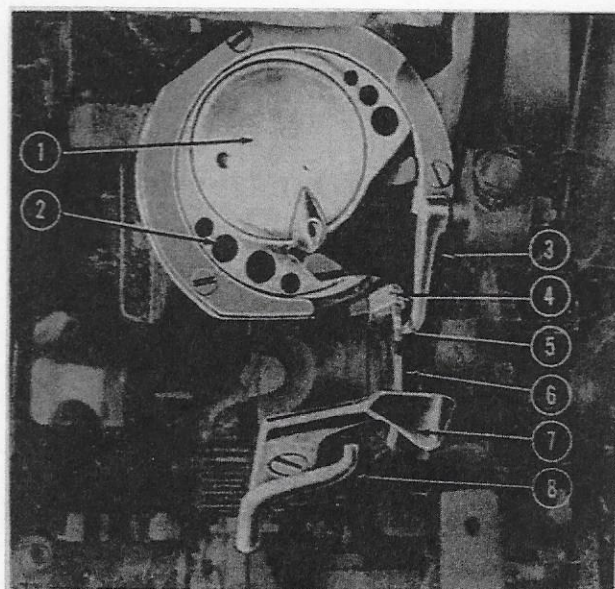


Fig. 10. Relative position of parts of machine.

Nomenclature	
1	Bobbin case.
2	Shuttle.
	Needle guide.
	Needle.
6	Awl.
7	Needle plate.
	Loop.

Fig. 11. Relative position of parts of machine.

b. To change the needle, turn the handwheel so that the needle is going up and the awl is down. When the point of the needle is 5/16 inch above the needle plate, the needle clamp nut can be reached through the opening between the shuttle case and the shuttle head. (See fig. 19.) Use the socket wrench furnished for that purpose. (See fig. 19.) Release the nut and remove the needle by pulling it through the slot of the work table. When the needle is out of the needle guide, give it a quarter turn toward the shuttle and take it out from the top.

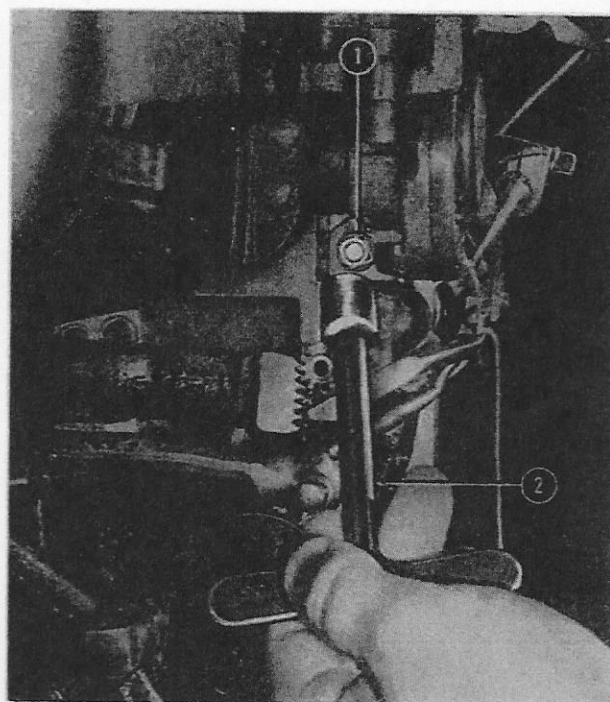
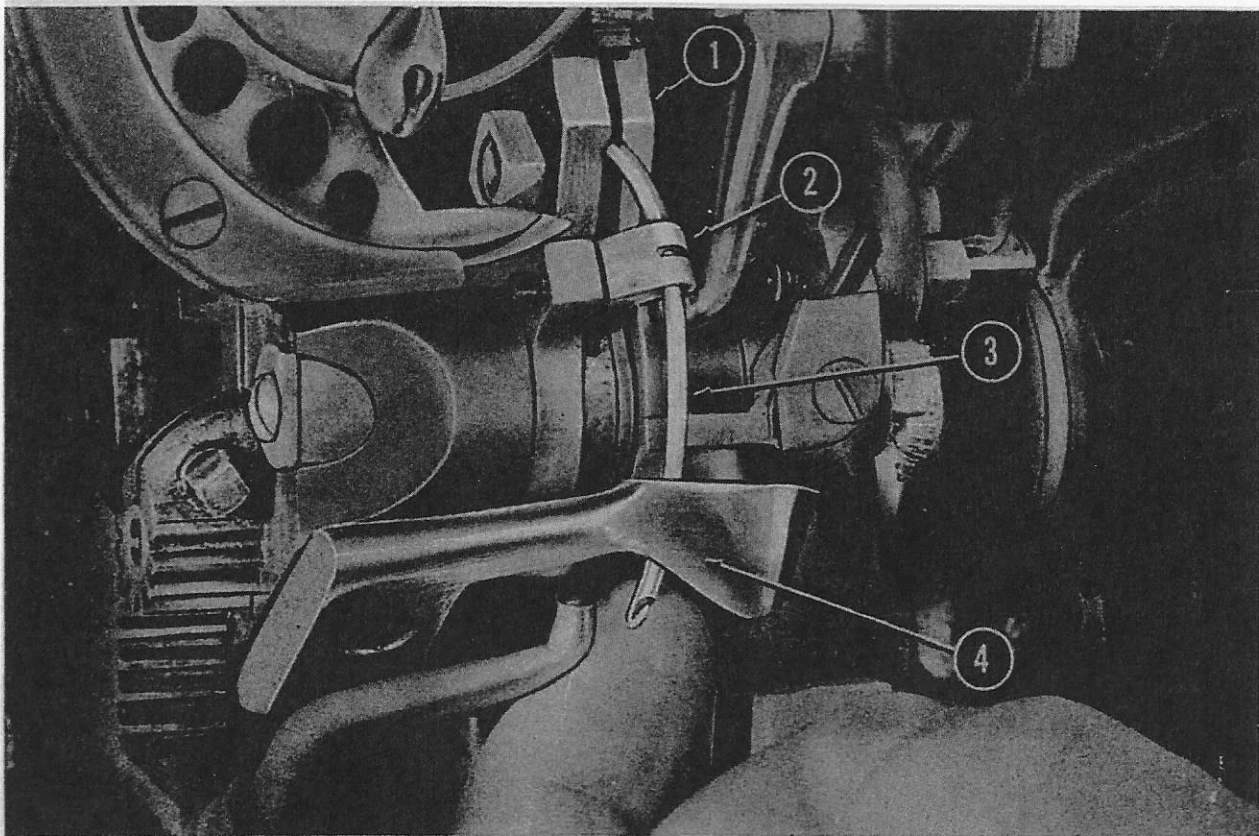


Fig. 11. Needle clamp nut and wrench.

Needle clamp nut.
Needle clamp nut wrench.

Fig. 12. Needle clamp nut and wrench.

c. If the needle is taken out when it is 1/16 inch above the needle plate, it can be replaced without removing the needle holder. For that reason, it is then possible to set the new needle (fig. 20) fairly close to the correct position the first time it is set. Then turn the handwheel until both the needle and the awl are going down. At that position, establish the correct relative position of the needle and awl. (See fig. 21.) However, as a further precaution, always check the needle with the needle guide at the point when the awl is feeding to the left. When the needle is set in the correct position, tighten the needle clamp nut securely.



Ref.
No.

W om-et'1. clatf1re

Needle clamp.
2 Needle guide.
3 Needle.
Needle plate.

Figure 20. Inserting needle.

30. Setting Awl

a. The awl should be set $1/16$ inch below the needle and about $1/32$ inch to the left of the needle when both the needle and the awl are moving downward. (See fig. 22.)

b. To remove the awl, begin by throwing the shoe guide forward. (See 2, fig. 45.) Turn hand-wheel to bring awl holder up. Release the clamp nut. Hold the awl and turn the handwheel to back the awl holder away from the shank of the awl.

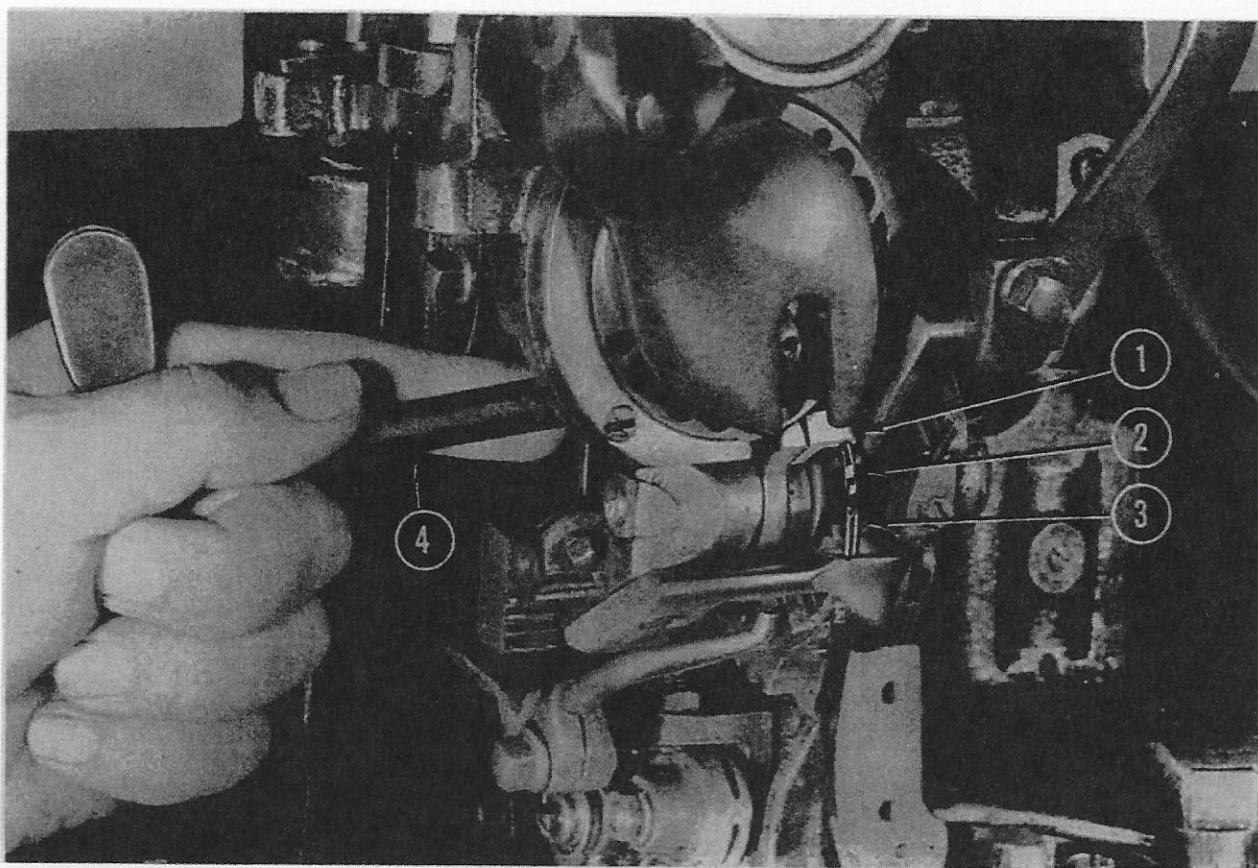
c. To set an awl in position (fig. 22), pass it up through the needle plate. Hold the awl and bring the awl holder up so that the shank of the awl will enter the groove of the holder. When the shank of the awl can be felt just protruding from the lower end of the clamp, tighten the clamp nut. if the awl is fastened in this way, the original setting

will be Very close to the correct position. (See fig. 21.)

d. The awl springs out of alignment when it is feeding the shoe. For that reason, the awl should be set so that the awl hole will line up with the needle while carrying the work. The awl should be set to travel about $1/32$ inch to the left of the needle at the end of the feed. That adjustment is made when the awl is set at the end of the feed.

31. Setting Lifter

a. The lifter (3, fig. 23) lifts the right-hand thread from the needle to the shuttle. It should be set to pass as close to the point of the needle (4, fig. 23) as possible and directly in the center of the two threads. (See fig. 24.) There should be $1/32$ inch between the lifter (1, fig. 25) and the shuttle (2, fig. 25) at the closest point.



R. f.
No.

нomenclature

2
3

Xeedle l! "tlide.
Xeedle.
AWL.
Xeedle clamp nut wrench.

Figure 21. cttmg ne, dle to a-u.:l.

b. To adju-t the lifter. loo en the bindino- ere\\.. (ee 1, fio-. 23.) The adju-tment of the lifter i controlled by mean- of an eccentric. (ee 2. fig. 23.) :.Im-e the lifter right or left to line up with the point of the needle. "ing it in or out to clear the hurtle by 1 32 inch. }foye it up and down until it ju t clear the point oi the needle. Tighten the bindina screw. (ee 1. fiu-.23.)

32. Operating Stitcher

a. Turnl the hand, Yheel oYer until the thread take-up lever (9. fiu-. 49) i- at it Jm,e t point.

b. "Yith the left hand. grap the -hoe "ith the sole facing up.

c. tep on the pres.erfoot treadle to raise the preerfoot.

d. Place the heel of the • hoe under the shuttle ca-e.

e. Tilt the toe of the hoe upward until the welt clear the needle plate or ,ork table and goe back again.t the hoe guide.

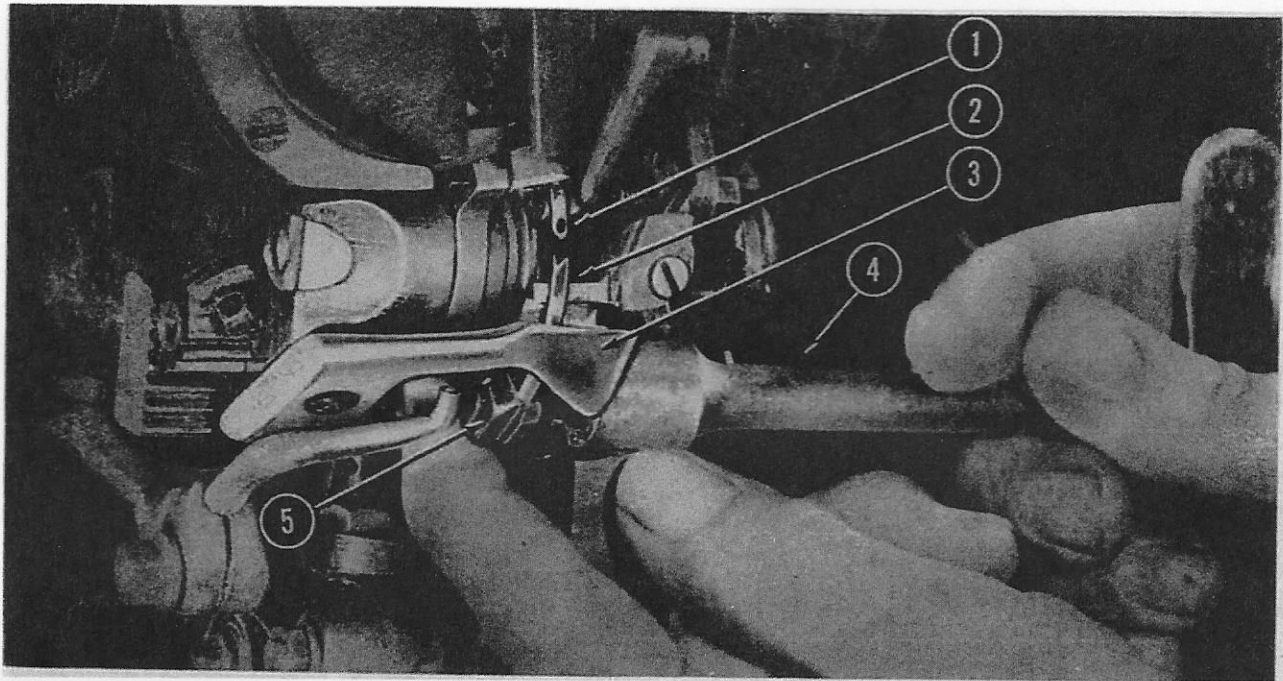
f. Relea e the pre.erfoot and set it firmly ag-ain t the ole of he shoe.

g. Turn the handwheel until the awl pierce the .ole.

h. Grasp the toe of the hoe in the riu-ht hand and the heel in the left hand.

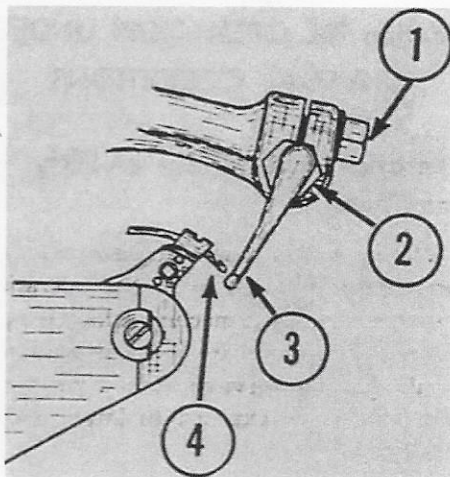
i. tart ewino- by pre.. ing dm,n on the clutch pedal with the left foot.

i. A the ritchin<T approache- the toe of the hoe, ea-e the pr - ure on the clutch pedal to lo,Y up the machine. A the rune' time hift the left hand to the left ide of he .hoe. and hiit the right hand to the right side of the hoe. Continue -ewing around the toe.



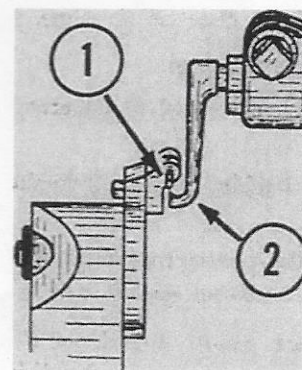
Ref. No.	Nomenclature
1	Needle.
2	Awl.
3	Needle plate.
4	Awl clamp nut > Tench.
5	Awl clamp.

Figure 22. Set 111g awl.



Ref. No.	Nomenclature
1	Binding screw.
2	Eccentric.
3	Thread lifter.
4	Needle.

Fig 11r-1. Left-hand side, adjusted.



Ref. No.	Nomenclature
1	Needle.
2	Lifter.

Fig 11r-2. Right-hand side, adjusted.

Part 1

Operation, Maintenance & Repair Landis No. 12 Model K Sole Stitching Machine

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Pilgrim Shoe & Sewing Machine Company, Inc.

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BOOK I

STITCHING MACHINE

Landis No. 12 models F and K
American models B, C, and CA

Operation, Maintenance and Repair

Landis No. 12 Model K sole stitching machine.

Chapter 1, Section I INTRODUCTION

1. Disclaimer

This manual is offered as a guide to shoe makers in the care and maintenance of their equipment. Pilgrim Shoe & Sewing Machine offers no guarantee as to the accuracy of this manual. If you are in doubt of your ability to undertake a repair to your machine, call a professional shoe machine mechanic.

2. Terminology

Throughout this catalog parts are referred to by name. For specific part numbers consult your Model 12 parts manual.

3. Scope

This manual contains instructions and information on the operation, maintenance and repair of the Landis No. 12 Model K sole stitching machine. These instructions will also apply to other Landis Model 12 machines.

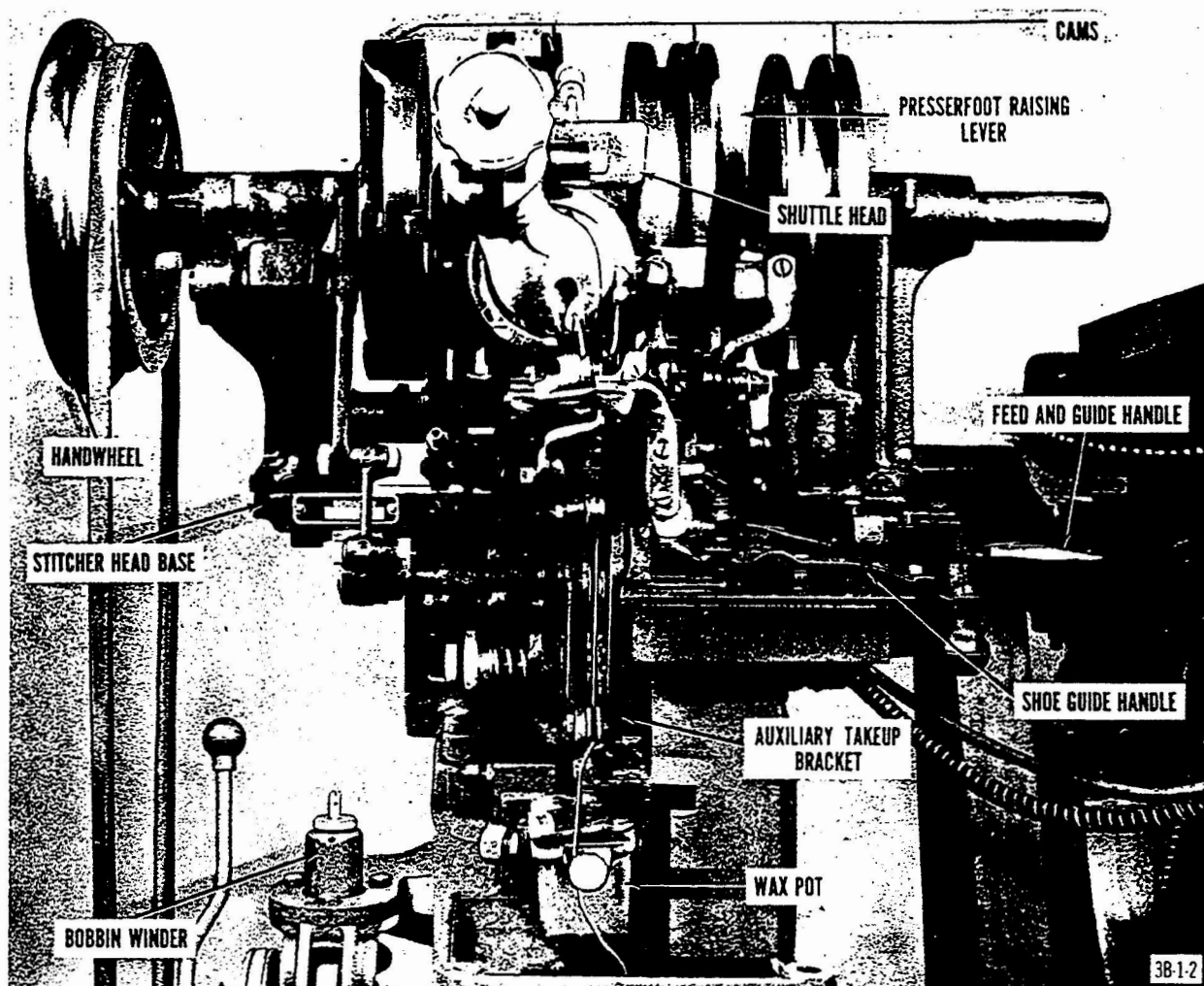


Figure 2. Head assembly.

4. Orientation

Throughout part one the terms right, left, front and rear indicate directions from the viewpoint of the operator facing the sole stitching machine in an operating position.

5. General

The Landis No. 12 Model K is a curved-needle, lockstitch, electrically operated sole stitching machine. The sole stitching machine consists of a head assembly, which includes a wax pot; a presserfoot release treadle assembly; a foot treadle for the power clutch; and a bobbin winder.

6. Head Assembly

a. General. The head assembly (fig. 2) is built around four cams fixed to a common cam-

shaft driven by a power belt attached to the power shaft in the unit frame. The cams, numbered from the left 1, 2, 3, and 4, control the sequence of operations of the functional parts of the head.

b. Functional Parts of Head Assembly.

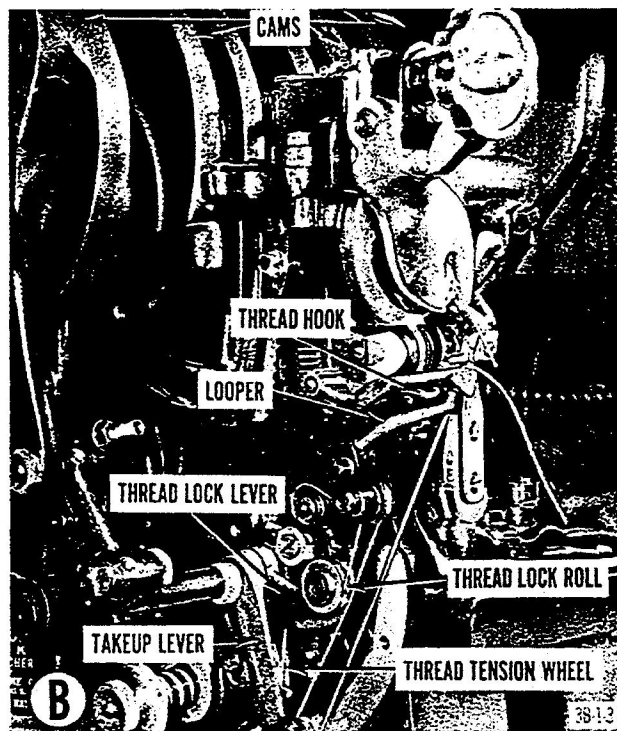
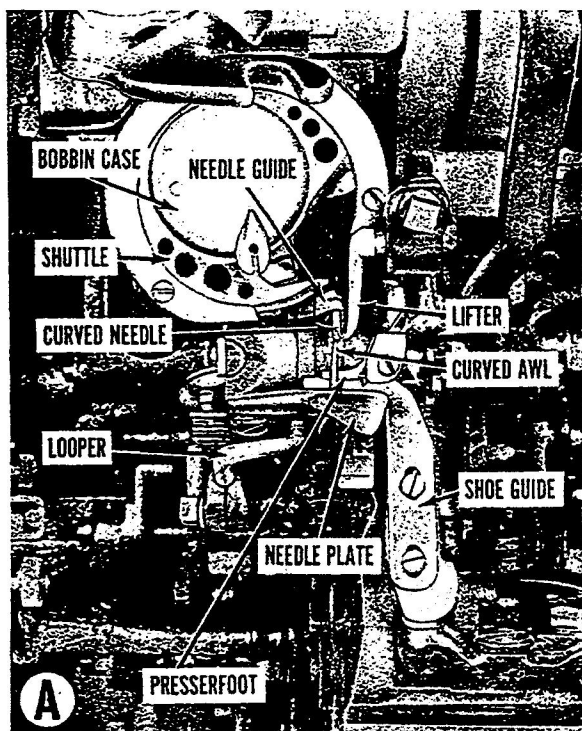
Functional parts of the head assembly (fig. 3) are those which work in conjunction with each other to form and correctly place the proper stitch in the sole of the shoe.

- (1) The curved awl (A, fig. 3) punches the hole in the sole of the shoe, at the same time moving the shoe to the left for the curved needle (A, fig. 3) to pass through the hole. It then feeds, or moves, to the right to punch the next hole.

- (2) The curved needle follows the awl through the hole in the sole and through the opening in the needle plate (A, fig. 3) until the needle reaches a point just below the plate.
- (3) The looper (A and B, fig. 3) together with the thread hook (B, fig. 3) holds the needle thread in such position that the thread may be looped over the barb of the needle. The needle then

needle and, as it turns, drops it on the shuttle itself. As the shuttle continues to turn, it carries the thread around until it crosses the bobbin thread forming the lockstitch.

- (6) The takeup lever (B, fig. 3), moving downward to its lowest position, pulls the lockstitch down into the outsole of the shoe; at the same time the thread lock lever (B, fig. 3) locks or holds the



A—Actual stitching parts

B—Takeup lever and thread lock lever

Figure 3. Functional parts of head assembly.

moves back up through the hole in the sole until it reaches a point above and behind the lifter (A, fig. 3) so that the thread is placed in the path of the lifter.

- (4) The lifter raises the right thread of the loop from the needle and holds it free for the action of the shuttle (A, fig. 3). The needle continues back with the left thread of the loop to hold it taut.
- (5) The point of the shuttle picks up the needle thread from the lifter and the

feeding thread until the stitch is in the sole.

- (7) The procedure is then repeated with the presserfoot (A, fig. 3) holding the sole to the needle plate and the shoe guide (A, fig. 3), guiding the shoe so that the stitch will be the proper distance from the edge of the sole.

c. *Wax Pot.* The wax pot (fig. 2) is located at the center of the lower portion of the head assembly. When wax in the pot is properly heated and melted, it acts as a lubricant for the thread and aids in passing it through the

thread-handling mechanism of the stitcher. The wax also tends to strengthen and prolong the life of the thread and the stitch.

7. Bobbin Winder

The bobbin winder (B, fig. 1) is located on the left side of the stitching machine. It is used to rewind the bobbin with bobbin thread after the thread has passed through the wax pot.

8. Controls

a. The following controls are mounted on a panel at the rear of the stitcher (B, fig. 1):

- (1) The heat switch turns on current for the heating elements (par. 9).
- (2) The heat regulator controls amount of heat used.

b. The following controls are in the head assembly (fig. 2):

- (1) The feed and guide handle regulates movement of the awl for length of stitch.
- (2) The shoe guide shifter handle regulates the shoe guide to keep stitch proper distance from edge of sole.
- (3) The presserfoot raising lever is used to apply pressure to the presserfoot and then to the shoe when starting to stitch.
- (4) The handwheel (B, fig. 1) is mainly used to drive the machine, and also to stop and start the machine by hand and to move the functional parts when making adjustments.
- (5) The bobbin winder shifter handle, attached to the left side of the bobbin winder (A, fig. 1), stops and starts the winder.
- (6) The stitcher clutch treadle, located at the left front of the base of the machine (A, fig. 1), is used for operation as well as to regulate speed.
- (7) The presserfoot release treadle, located at the right front of the base of the machine (A, fig. 1), is used to raise

the presserfoot, release thread tension, and lower the thread lock.

- (8) The power switch is located at the rear of the stitcher, on the front of the finisher.

9. Heating Elements

a. Heating the sole stitching machine is one of the most important factors in its operation. The machine will not operate properly unless the wax and the thread-handling parts are heated sufficiently to keep the wax soft and the thread moving easily during operation.

b. There are three flat, conduction-type heat units. One is clamped to the shuttle head (fig. 2) for heating the shuttle and the thread in the bobbin. Two other heat units are clamped to the auxiliary takeup bracket to heat the takeup lever and thread rolls, and to heat the wax pot and keep wax at proper temperature of 190° F. (Fahrenheit).

c. A thermostatic control (par. 20) keeps the machine from getting too hot.

10. Motor

One electric motor powers
the Model 12 K.

The single-phase, 60-cycle, 100- to 120-volt motor develops 1½ horsepower and operates at 1,750 rpm (revolutions per minute). The motor has thermal overload protection.

11. Performance

a. *Operating Speed.* The countershaft of the combination unit should be run at a speed of approximately 600 rpm. At that speed the camshaft in the head of the stitcher will operate at the prescribed speed of 250 to 300 rpm.

b. *Operating Capacity.* When the machine is run at the prescribed speed by a skilled operator and the welts and soles of the shoes are properly prepared for stitching, the stitcher will sew 30 to 40 pairs of shoes per hour.

12. Tools and Repair Parts

Lists of tools and repair parts for the stitching machine appear in paragraphs 204 and 205.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

13. General

The stitcher head assembly is detachable from the Model 12 K—

14. Cleaning

Remove masking tape and rust preventive compound. Clean operating parts of head assembly with SD (Solvent, dry-cleaning). *Do not use gasoline or abrasive materials.* Pay particular attention to cam and cam races; their wearing surfaces are easily damaged by dirt and grit.

15. Inspection

Inspect head assembly thoroughly for broken, damaged, or loose parts. Examine all accessible wiring and conduits, heat units, and work light to see that they are in good condition and securely connected. See that clutch treadle and presserfoot release treadle are properly connected.

16. Lubrication

Lubricate all points of head assembly and other parts of stitching machine in accordance with instructions in paragraphs 33, 34, and 35.

17. Run-in Test

Perform run-in test in *a*, *b*, and *c* below to check action of machine and proper functioning through correct adjustments of all func-

tional parts. During the run-in test, moving parts will act as their own abrasives, and action of the machine will tend to remove burs and rough edgings on the parts.

a. Turn handwheel forward slowly; it should turn smoothly without binding in the camshaft or cam races. As the wheel turns, check position of awl and needle, and make sure that relative positions of lifter, looper, thread hook, shuttle, and presserfoot are correct in accordance with instructions in paragraphs 45 through 55. Make any necessary adjustments.

b. When the machine appears to run smoothly during this slow operation, plug in power line and turn power switch (A, fig. 4) to ON. Block clutch treadle down and run machine for 4 hours with periodic halts for check of positions of functional parts of equipment and for any necessary adjustments.

c. Do not leave machine running unless operator is present to stop machine at first sign of mechanical failure.

d. Prepare and test machine for proper stitching (par. 29).

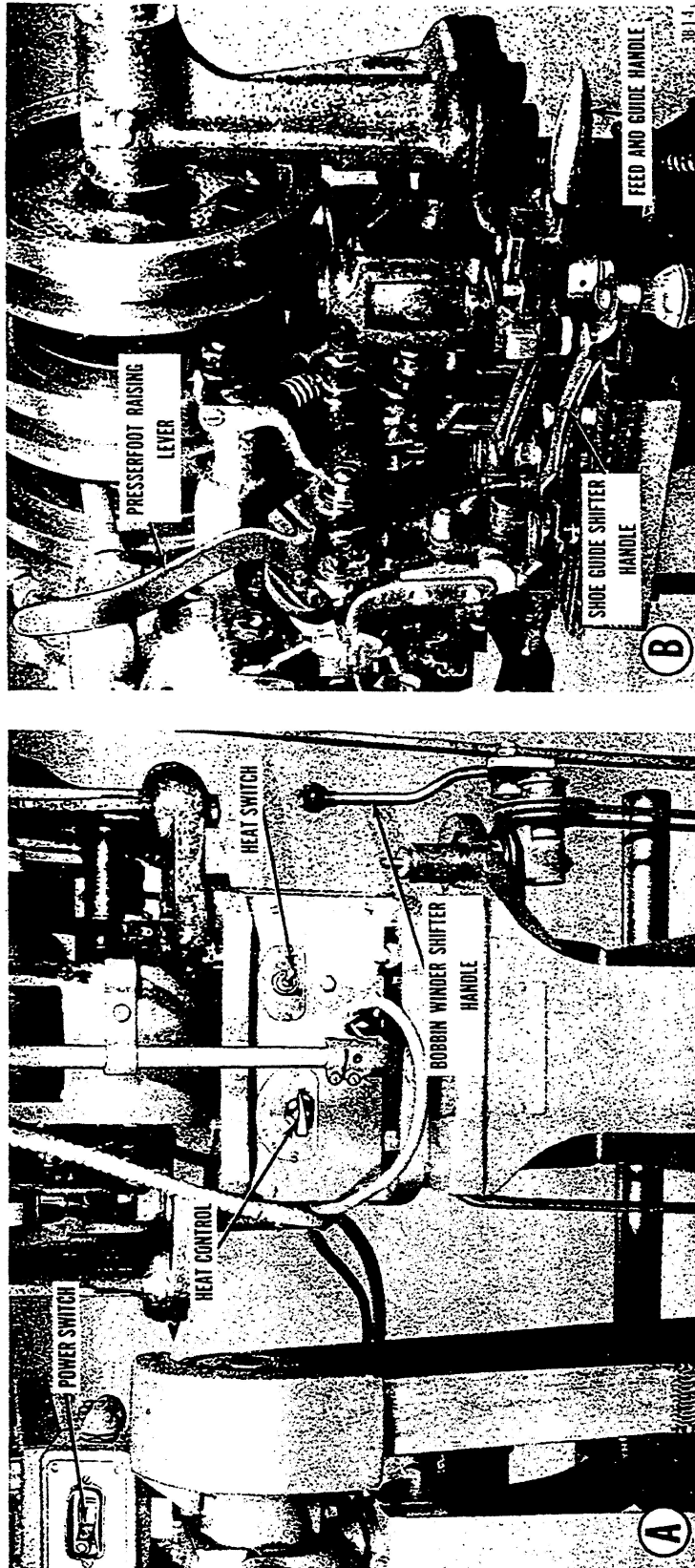
18. Correction of Deficiencies

Treat deficiencies disclosed during inspection and testing as follows:

a. Correct those deficiencies within the scope of organizational maintenance.

b. Refer those beyond the scope of organizational maintenance to a higher echelon for correction.

c. Refer those of a serious nature to the supplying organization through proper channels.



A—Controls on panel at rear of machine B—Controls on front of head assembly
Figure 4. Stitching machine controls.

Section II. CONTROLS AND INSTRUMENTS

19. Heat Switch

The heat switch (A, fig. 4) is mounted on the upper right hand corner of the control panel on the rear of the stitcher. ON and OFF positions are marked on the switchplate.

20. Thermostatic Heat Control and Heat Control Switch

a. Thermostatic Heat Control. The Landis No. 12 Model K stitching machine is equipped with an automatic thermostat heat regulator which prevents the machine from overheating. A capillary tube extends from the body of the thermostat to a thermostat feeler bulb attached to the auxiliary takeup bracket. This feeler bulb contains a thermal element which is responsive to an increase in heat beyond the maximum temperature of 190° to 200° F. required for operation of the machine. The thermal element reacts to extreme temperatures to move a diaphragm, opening an electric switch in the body of the thermostat and breaking the circuit. When the machine cools sufficiently, liquid in the thermal element contracts to close the switch.

b. Heat Control Switch. A manually-operated heat control switch on the control panel (A, fig. 4) determines the amount of current that will be supplied to the heating elements (par. 9). When the indicator is in the LOW position, enough current is supplied to keep the machine warm during longer than ordinary pauses during operation. When the indicator is in the HIGH position, the full load of the current is supplied to the heating elements to warm the machine and maintain it at the proper operating temperature.

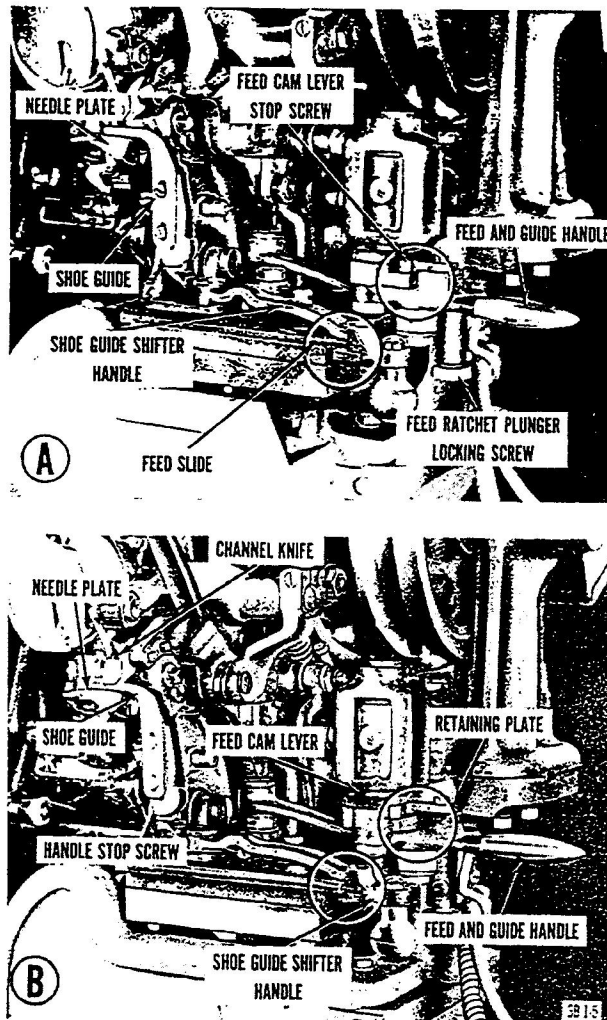
21. Power Switch

The power switch (A, fig. 4) is on the front of the finisher portion of the stitcher-finisher unit, and to the left of the control panel on the rear of the stitcher. Power switch ON and OFF positions are marked. When the switch is in the ON position, the motor turns the drive shaft to transfer movement to the stitcher (or finisher) and the bobbin winder when the clutches are engaged.

22. Feed and Guide Handle (Stitch Control)

The feed and guide handle (B, fig. 4) regulates the length of each stitch as it is sewed in

the sole of the shoe. The handle has forward and rear positions, but can be set at intermediate points between these positions. Loosen feed ratchet plunger locking screw (A, fig. 5) to move feed and guide handle. Retighten locking screw after adjustment has been made.



A—Set for long stitch for combat shoe rubber soles
B—Set for short stitch for low-quarter shoe leather soles

Figure 5. Shoe guide and stitch controls set for proper stitching.

a. To lengthen stitch, move handle forward until it touches feed cam lever stop screw (A, fig. 5).

b. To shorten stitch, move handle to rear,

lining up oilholes in cam lever and retaining plate (B, fig. 5).

23. Shoe Guide Shifter Handle (Shoe Guide)

The shoe guide (B, fig. 4) determines how far from the edge of the sole the stitches will be made.

a. To move stitching away from edge of sole, pull shoe guide shifter handle (A, fig. 5) forward until it is flush with edge of feed slide.

b. To bring stitching closer to edge of sole, move shoe guide shifter handle to rear as far as possible. Handle stop screw should be in far enough so guide does not come too far forward and block opening in needle plate (A, fig. 5).

24. Presserfoot Raising Lever

The presserfoot raising lever (B, fig. 4) is the hand control for the presserfoot and is used to apply additional pressure on the shoe when starting to stitch. To apply pressure, pull handle forward, then release.

25. Handwheel

The handwheel (fig. 2), on the left end of the camshaft, is used to stop and start the machine by hand. The handwheel is connected to the drive pulley on the power shaft by a belt to drive the head of the machine. In starting the machine, push handwheel to the rear, step on clutch treadle, and stitcher will

be set in motion. To stop stitcher, release clutch treadle and hold handwheel. The handwheel always turns to the rear in operation, and is turned forward only to make certain adjustments.

26. Presserfoot Release Treadle

Downward action of the presserfoot release treadle (A, fig. 1) raises the presserfoot (A, fig. 3), releases pressure on the thread tension wheel (B, fig. 3), and lowers the thread lock. This allows a shoe to be placed in the machine or more thread to be pulled out if necessary. Releasing the treadle lowers the presserfoot and reestablishes thread tension and thread lock.

27. Clutch Treadle

Downward pressure on the clutch treadle (A, fig. 1) engages the stitcher clutch (A, fig. 1) on the power shaft to activate the stitcher drive belt and set the stitcher in motion. Increasing pressure on the treadle increases the speed of the stitcher until the treadle is in its bottom position and the stitcher is running at maximum speed. Releasing the treadle disengages the clutch and stops the machine.

28. Bobbin Winder Shifter Handle

The bobbin winder shifter handle (A, fig. 4) stops and starts the bobbin winder. Pull shifter handle forward to start bobbin winder; push handle to rear to stop.

Section III. OPERATION UNDER USUAL CONDITIONS

29. Preparation for Operation

a. *Heating Machine.* Turn on heat at least 30 minutes before stitching begins, to heat machine thoroughly and raise temperature of wax to 190° F. Heat is turned on by placing heat switch in ON position and heat control to HIGH position.

b. *Lubricating.* While machine is heating, lubricate completely (pars. 33-35).

c. *Filling Wax Pot.*

- (1) The wax pot should be at least half full and the wax clear and yellow. It is easier to control condition of the wax when pot is kept at this level. Fresh wax is then added when needed.
- (2) Always have enough wax in the pot to help in melting new wax when it is added.

- (3) Wax is supplied in a hardened cake form. Break wax in small pieces, place in wax pot, and add more wax as needed.

d. *Matching Sizes of Needles, Awls, Threads, and Needle Guides.*

- (1) All needles, awls, threads, and needle guides must be properly matched in size for proper operation of stitcher.
- (2) The awl and needle guide will be changed every time the needle size is changed. The needle guide is stamped with the last number of the needle with which it is to be used.
- (3) The following sizes should be used together:

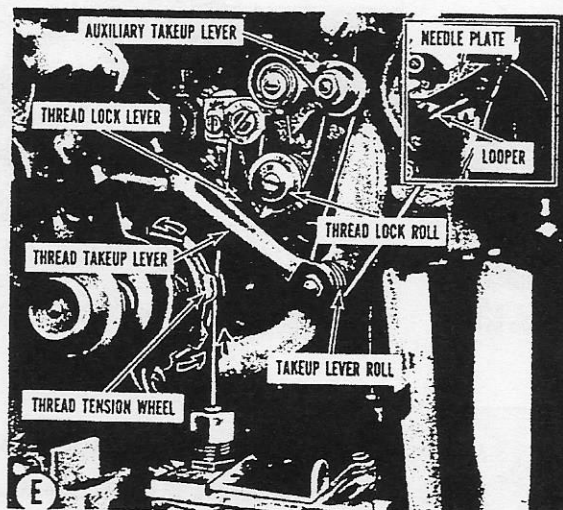
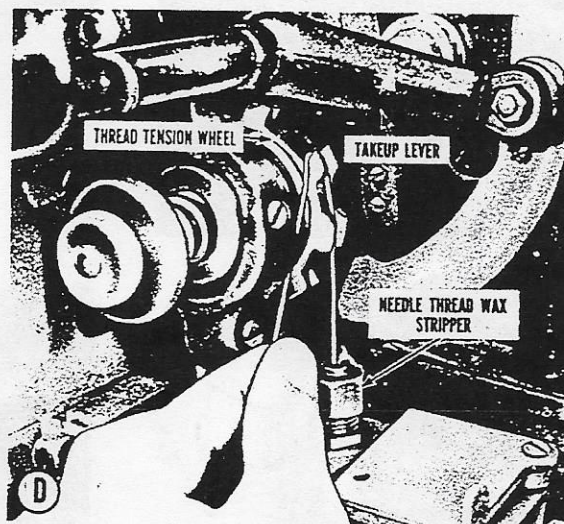
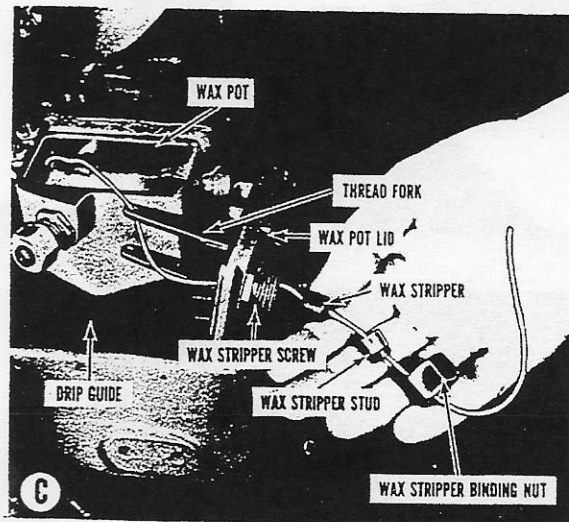
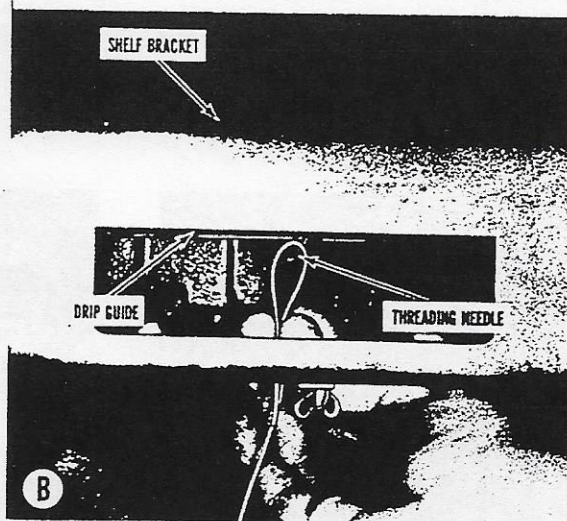
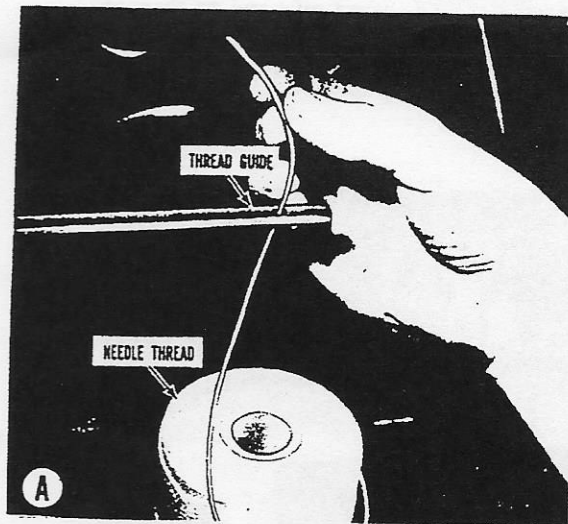


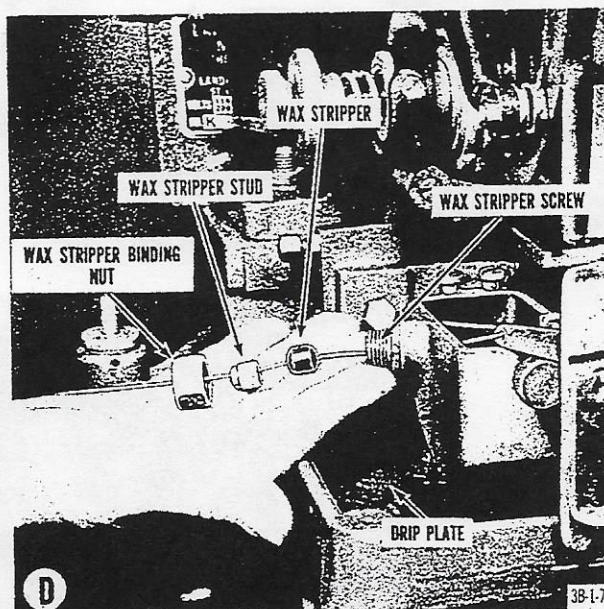
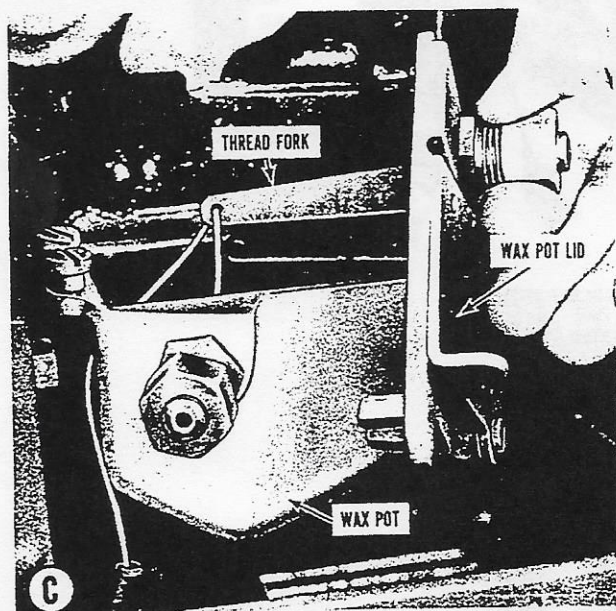
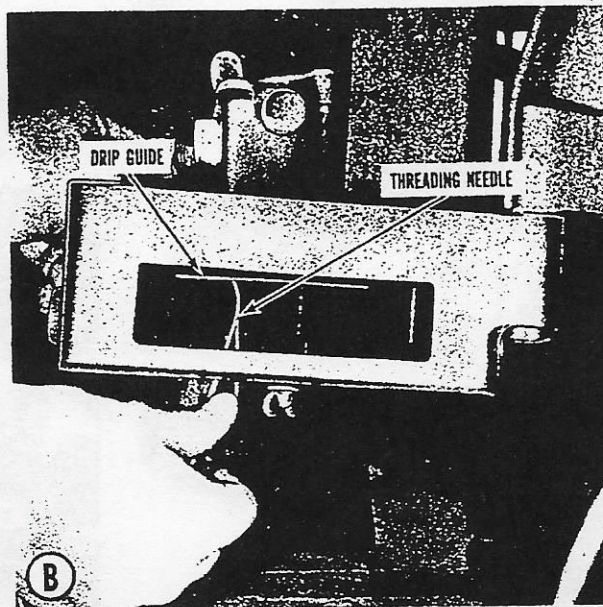
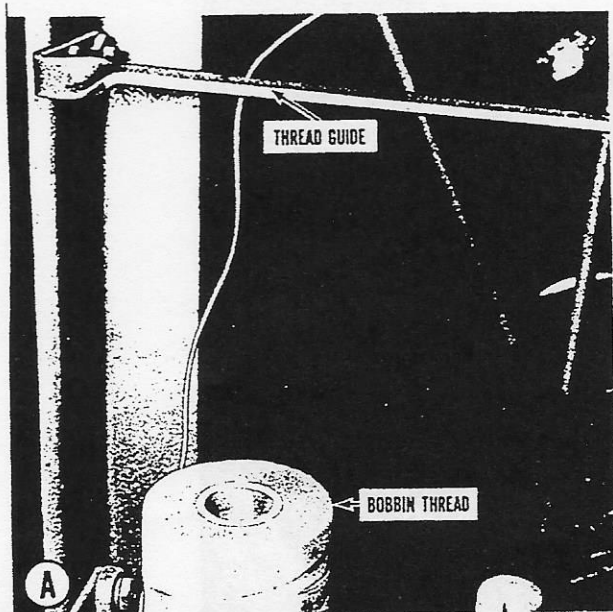
Figure 6. Threading machine with needle thread.

38-1-6

- A—Passing thread through hole in thread guide
 B—Passing thread through right hole in drip guide
 C—Passing thread through wax pot hole and fork and wax pot stripper

- D—Looping thread on tension wheel
 E—Thread passing around thread rolls and up through looper and needle plate

Figure 6—Continued.



- A—Thread passing through rear hole in thread guide
 B—Passing thread through left hole in drip guide

- C—Passing thread through left hole in wax pot and left fork
 D—Passing thread through side wax stripper

Figure 7. Threading machine with bobbin thread.

Needle No.		Awl No.		Needle guide	Top thread	Bobbin thread
Landis	USMC*	Landis	USMC*	No.	Cord	Cord
24	45	24	43	4	10 or 9	9 or 8
23	47	23	45	3	8	7
22	50	22	47	2	7	6

*United Shoe Machinery Corporation

e. Threading Machine With Needle Thread.

Refer to figure 6 and proceed as follows:

- (1) Place spool of thread on needle thread holder at front left side of frame. Be sure number inside spool is at top.
- (2) Pass thread up through hole in thread guide (A).
- (3) Use curved needle for threading guide, loop thread over barb of needle (B), and pass thread through right hole in drip guide.
- (4) Remove wax pot lid by loosening thumbscrew on front of wax pot.
- (5) Pull thread through right hole in rear of wax pot and then through right fork on wax pot lid from right to left (C).
- (6) Disassemble wax pot stripper located on top of wax pot lid. Using stripper wrench, remove nut by turning to left and then remove stud and stripper (C).
- (7) Use needle to pull thread through stripper screw, stripper, stud, and nut, making sure that small part of stud is up and faces nut.
- (8) Reassemble stripper assembly and tighten nut.
- (9) Place lid on wax pot and tighten thumbscrew enough to hold.
- (10) Adjust wax pot stripper (par. 55b) to provide sufficient wax for proper action.
- (11) Turn handwheel until takeup lever (D) moves up enough to clear thread tension wheel.
- (12) Pull thread through stripper and form loop over one cog on tension wheel (D).
- (13) Step on presserfoot treadle to release tension on tension wheel; turn wheel to rear until thread has made one complete turn. Thread will then

come from wax pot to left and around to where threads come together (E).

- (14) Use curved needle as guide and pass thread up behind takeup lever and thread lock lever (E), and over rear of thread measure roll behind guard and down front of roll.
- (15) Step on presserfoot lever to lower thread lock lever (E) and pass thread under thread lock roll.
- (16) With loop of thread over needle barb, pass thread around rear and down front of auxiliary takeup lever roll (E).
- (17) Bring thread down to and around thread takeup lever roll (E).
- (18) Turn handwheel until looper (E) is in line with hole in needle plate, and pass thread through looper and needle plate.
- (19) Place takeup lever in its lowest position and check thread tension by pulling on thread. Thread should pull freely without binding or without being too loose. If thread binds, turn thread tension adjusting disk forward to loosen tension.

f. Threading Machine With Bobbin Thread.

Refer to figure 7 and proceed as follows:

- (1) Place spool of thread on bobbin thread holder at rear on left side of frame. Be sure number inside spool is at top.
- (2) Pass thread up through hole in thread guide (A).
- (3) Use curved needle as a guide, loop thread over barb of needle, and pass thread through left hole in rear of drip guide (B).
- (4) Remove wax pot lid and pass thread through left hole in rear of wax pot and through hole in left fork on wax pot lid from right to left (C).
- (5) Disassemble stripper on left side of wax pot (D), thread stripper, and reassemble (e(6)-(8) above).
- (6) Replace wax pot lid, and tighten thumbscrew securely.

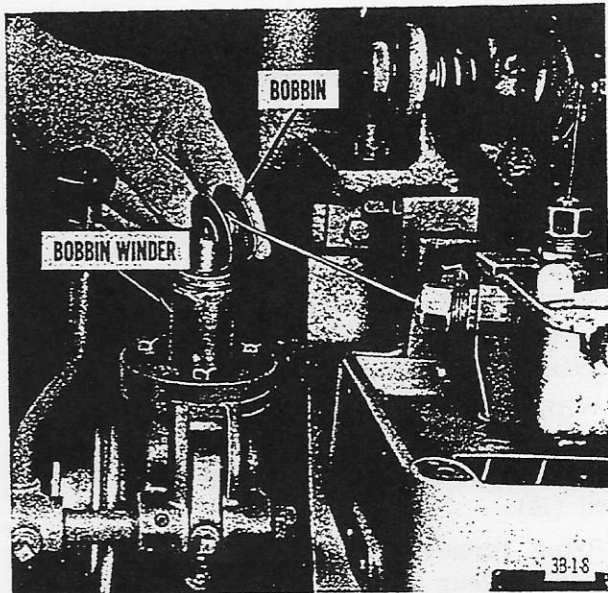


Figure 8. Placing bobbin on bobbin winder.

- (7) Adjust stripper for proper amount of wax on thread.

g. Winding Bobbin. Before operation and from time to time during operation it is necessary to rewind bobbin with bobbin thread after removing bobbin from shuttle case and bobbin case (A, fig. 3).

- (1) Place bobbin on bobbin winder with bearing surface of bobbin down (fig. 8).
- (2) Wind thread around bobbin 3 turns.
- (3) Start motor and engage bobbin winder by moving shifter handle forward.
- (4) When sufficient thread has been wound on bobbin move shifter handle to rear to stop bobbin winder.
- (5) Cut bobbin thread 3 inches from wax pot and remove bobbin from spindle.
- (6) Thread bobbin case as follows:
 - (a) Pass end of bobbin thread from bobbin through hole in side of case (A, fig. 9).
 - (b) Place bobbin in case with bearing surface down, pass thread through horn in bobbin case, and pull thread down in between tension spring (B, fig. 9).
- (7) Lubricate shuttle, needle guide, needle segment, and awl segment (par. 34).
- (8) Place bobbin case in shuttle with horn in proper position (C, fig. 9).

- (9) Check tension of bobbin thread by pulling on thread. Thread should pull easily and without binding. To adjust, turn eccentric (B, fig. 9) to left to increase tension.

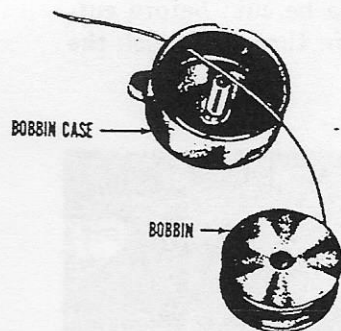
h. Adjusting for Proper Stitching. Before operation, the machine must be adjusted for type of material to be used and type of shoe to be repaired. The feed and guide handle (par. 22) and shoe guide shifter handle (par. 23) are used for this adjustment. In addition, the presserfoot channel knife (B, fig. 5) must be raised or lowered as necessary. Always set machine for proper stitch before adjusting channel knife.

- (1) *Rubber* (usually used for combat shoes).
 - (a) Rubber soles require a long stitch; just as described in paragraph 22a.
 - (b) Combat shoes require heavier soles than low-quarter shoes. To keep stitching at full strength, stitching should be farther in than usual from edge of sole; adjust shoe guide (par. 23a).
 - (c) The channel knife should never be used on rubber as it will split the sole, and the stitch will pull too deeply. Raise channel knife (par. 54a).
- (2) *Leather* (usually used for low-quarter shoes).
 - (a) Leather soles require a short stitch; adjust as described in paragraph 22b.
 - (b) Stitching is closer to edge than in combat shoes; adjust as described in paragraph 23b.
 - (c) Lower and adjust channel knife (par. 54).

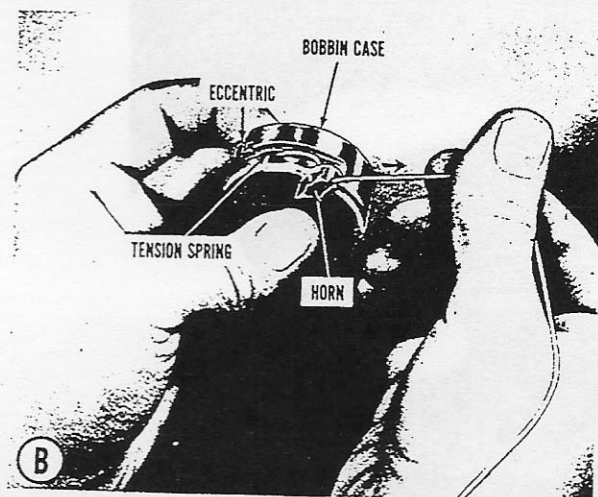
i. Checking Thread Tension. Thread should pull easily and without binding.

j. Checking for Proper Stitching.

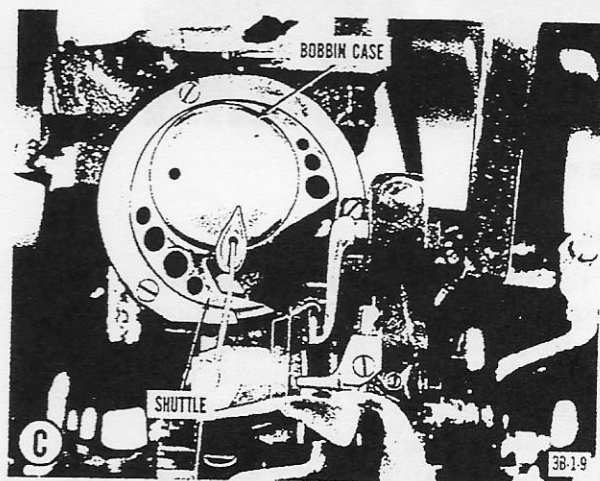
- (1) Turn on power switch.
- (2) Use a piece of scrap material (either leather or rubber, depending on type of shoe to be repaired) and make a few stitches, following procedure for sewing in paragraph 30.
- (3) Cut away edge of sole until thread lock is exposed. Lock should be in the



A



B



- A—Thread passing through hole in bobbin case
 B—Threading horn and tension spring
 C—Bobbin case in shuttle

Figure 9. Bobbin case threading.

center of material (par. 50). Make adjustments if necessary.

k. *Wetting Sole.* Dip sole of shoe into a pan of water and hold sole under water briefly. Water makes sole and welt more flexible and reduces amount of needle breakage.

30. Operation of Stitcher

a. Turn handwheel toward rear until takeup lever is in its lowest position and needle and awl are clear to needle plate (B, fig. 3).

b. Step on presserfoot treadle to raise presserfoot, release thread tension, and lower thread lock lever.

c. Holding heel of shoe with left hand and toe in right hand, place shoe in machine with sole facing up (fig. 10).

d. Set sole on needle plate with edge resting against shoe guide. The shoe should be placed so that stitching may start 3 to 5 stitches behind splice line for a half sole. For a full sole, start at point where welt ends (fig. 10).

e. Release presserfoot treadle and pull down on presserfoot hand lever to set presserfoot firmly in place on sole.

f. Turn handwheel to rear until awl pierces sole.

g. Step on power treadle to start operation of machine.

h. Hold shoe firmly, but *do not press, pull, or twist shoe*. It is necessary only to guide the shoe. Action of the awl will feed or move shoe as it is being stitched.

i. As the stitching rounds the toe, gradually shift left hand toward toe and right hand toward heel. Continue stitching 3 to 5 stitches beyond splice line. If necessary, pressure on power treadle may be eased to slow machine as stitching approaches and rounds the toe.

j. When stitching is completed, release power treadle and grasp handwheel to allow it to turn only enough to complete the last stitch and bring needle and awl free of shoe.

k. Step on presserfoot treadle to raise presserfoot and relieve tension and lock on thread.

l. Pull shoe forward out of machine and cut bobbin thread 3 inches from bobbin. Continue pulling on shoe and cut needle thread 12 inches from needle plate to leave enough thread to prevent it from being pulled down through needle plate and looper when machine is being set for next shoe.

m. Cut threads where stitching finishes on shoe. First cut bobbin thread where it comes out of sole, then cut needle thread where it comes out of welt. Be careful not to cut shoe with knife.

n. Thread extending from place where first stitch was made must also be cut; before cutting, pull needle and bobbin threads to lock the stitch in sole.

o. Turn off motor.

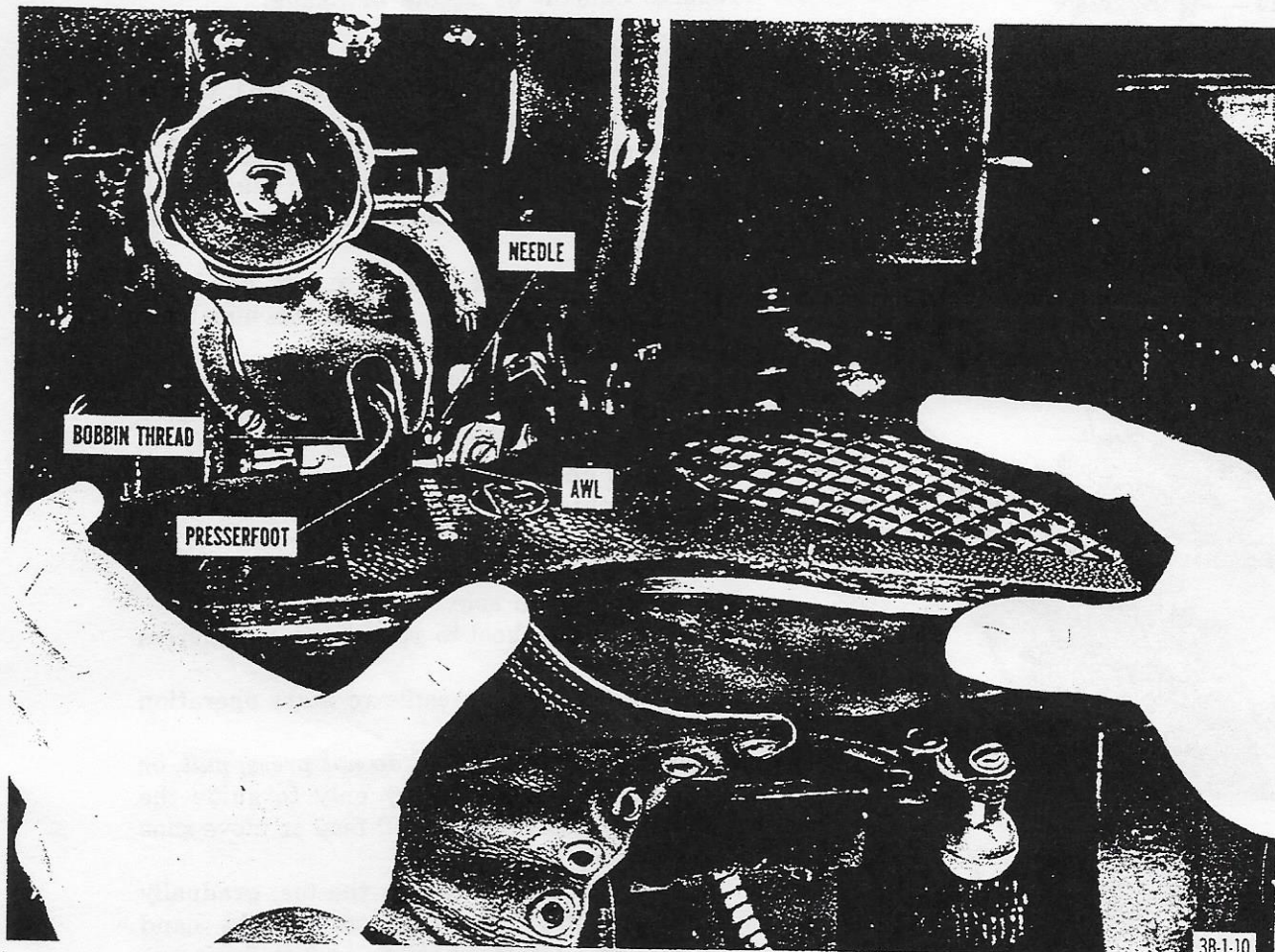


Figure 10. Shoe held in position for stitching operation.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

31. Dusty or Dirty Conditions

a. Shorten service and lubrication intervals to keep machine clean and well lubricated at all times for proper operation.

b. Remove all sand and grit from shoes to be stitched. Sand and grit will work into parts of the machine and cause needle and awl breakage during stitching.

32. Extreme Heat or Cold

a. *Extreme Heat.* Any heat in which the operator can work will affect nothing in the machine but the wax. Condition of the wax

should guide the operator in adjusting the heat control to compensate for high air temperature around the machine. Wax should not be allowed to boil as it will become burned and hardened, affecting operation of the machine.

b. *Extreme Cold.* Total wattage of the heating elements of the stitcher will not keep the wax or the machine warm enough for proper operation if air temperature falls below 60° F. Equipment should be set up in a heated tent, if possible, and every effort be made to protect wax and thread-handling mechanism from cold drafts.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE

Section I. LUBRICATION

33. Preparation for Lubrication

Clean all parts of stitching machine thoroughly (par. 37) before lubricating. Allow all parts to dry before lubrication.

34. Head Assembly

a. The lubrication chart (fig. 11) prescribes lubrication points, intervals, procedures, and lubricants for the head assembly of the sole stitching machine. The head assembly *must* be lubricated every 4 hours, and observance of all instructions in the lubrication chart is essential to proper maintenance and operation of the machine.

b. Arrows, on the illustrations of the lubrication chart, indicate oilholes and reservoirs for lubrication points, with the following exceptions to which points lubricant is applied directly: cams (1, left front view), auxiliary takeup lever (5, left front view), needle guide, needle segment and awl segment (15, right side view), and looper cam lever slide block (4, rear view).

35. Additional Lubrication Points

In addition to the head assembly, the following additional lubrication should be performed as indicated in *a* through *c* below.

a. Twice each day, lubricate the following parts with 2 or 3 drops of prescribed lubricant:

- (1) Lubricate bobbin winder shaft and bobbin winder shifter lever shaft (A, fig. 12) with OE-50 (lubricating oil, internal combustion engine).
- (2) Lubricate the following points on the stitcher clutch assembly (B, fig. 12) with OE-10 (lubricating oil, internal combustion engine).

(a) Drive pulley oil point.

(b) Treadle shaft at front and rear brackets, and treadle fork disk.

b. Once a month lubricate motor (A, fig. 1) by filling hinged cup oilers with OE-30 (lubricating oil, internal combustion engine).

c. Lubricate drive shaft bearings in accordance with instructions contained in paragraph 94.

Section II. PREVENTIVE MAINTENANCE

36. Responsibility

Preventive maintenance services are a function of the using organization. These services consist generally of before-, during-, and after-operation services performed by the operator.

37. Cleaning

The complex nature of the sole stitching machine and the large number of its moving parts mean that the operation of a dirty machine will cause much more damage than ordinary wear. The machine must be kept free of all dirt, grit, and accumulation of hard wax. Procedures in *a* through *d* below will be performed after op-

eration and before periodic lubrication under normal conditions. Power must always be turned off before cleaning. Heat control may be turned to LOW for periodic cleaning during operation.

a. *Bobbin, Bobbin Case, and Shuttle.* Refer to figure 13, and proceed as follows:

- (1) Release bobbin case guide arm (2) by turning guide arm lever to left.
- (2) Remove bobbin case (3) with bobbin.
- (3) Remove bobbin from bobbin case and remove any thread on bobbin.
- (4) Remove 3 shuttle ring screws (1)

LUBRICATION CHART

SOLE STITCHING MACHINE (LANDIS MODEL 12K) HEAD ASSEMBLY

Intervals given are maximums for normal operation. For abnormal conditions or activities, intervals should be shortened to compensate. Extend when not in use.

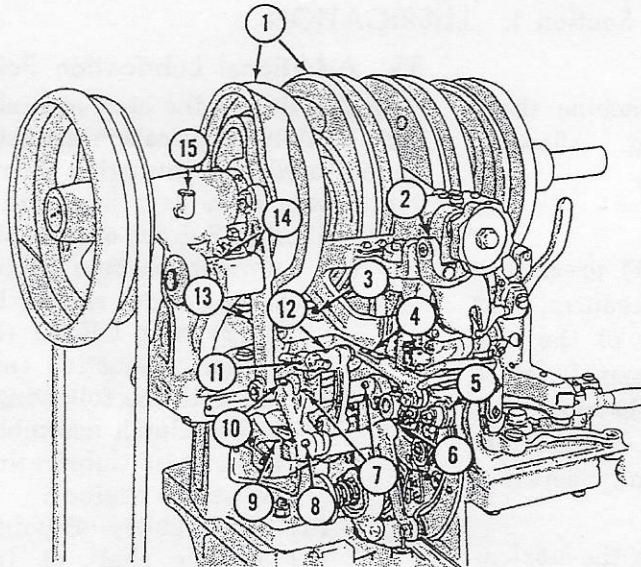
Clean all parts with Solvent, dry-cleaning (SD).

Dry before lubricating.

For intervals and lubricants refer to KEY.

LEFT FRONT VIEW

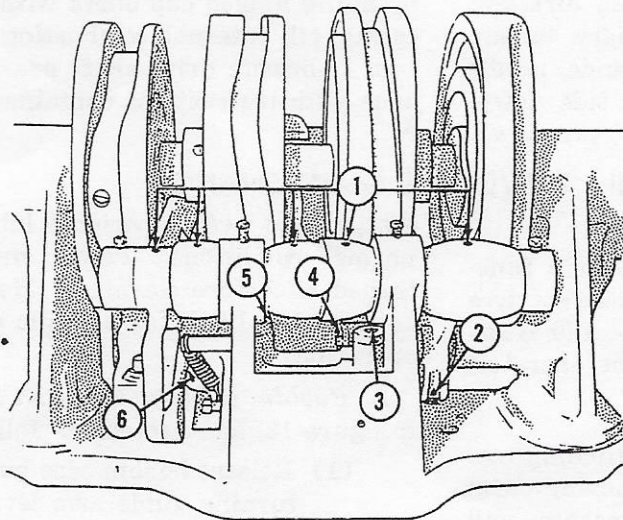
- 1 No. 1 and No. 2 Cams (See Note 1)
- 2 Guide Arm Pivot Stud
- 3 Shuttle Head Stud
- 4 Looper Bar Guide
- 5 Auxiliary Takeup Lever
- 6 Thread Lock Lever and Bushing
- 7 Thread Lock Rocker Shaft
- 8 Takeup Lever Stud



- 9 Takeup Lever
- 10 Takeup Lever Connector Stud
- 11 Thread Lock Rocker Shaft Swivel Connector
- 12 Thread Lock Rocker Shaft Swivel and Thread Lock Toggle Lever Stud
- 13 Thread Lock Cam Lever Pivot Stud
- 14 Takeup Cam Lever Pivot Stud
- 15 Camshaft

REAR VIEW

- 1 Cam Lever Shaft
- 2 Thread Lock Rocker Shaft Swivel Connector Stud
- 3 Looper Side Motion Cam Lever Pivot Stud



- 4 Looper Cam Lever Slide Block
- 5 Looper Forward Motion Cam Lever Pivot Stud
- 6 Presserfoot Cam Lever Eccentric

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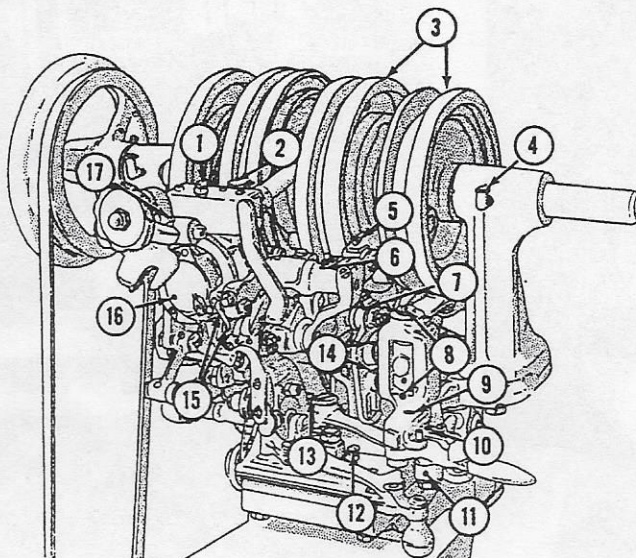
Figure 11. Lubrication chart, head assembly.

LUBRICATION CHART

SOLE STITCHING MACHINE (LANDIS MODEL 12K) HEAD ASSEMBLY

RIGHT FRONT VIEW

- 1 Shuttle Case
(See Note 2)
- 2 Shuttle Driver and Awl
Segment
- 3 No. 2 and No. 3 Cams
(See Note 3)
- 4 Camshaft
- 5 Thread Lifter Slide Block
- 6 Thread Lifter Pivot Stud
- 7 Thread Measure Adjust-
ing Bracket Eccentric
- 8 Feed Cam Lever Pivot
Stud



- 9 Feed Adjusting Lever
Slide Block
- 10 Feed and Guide Handle
Retaining Plate
- 11 Feed Ratchet Rod Stud
- 12 Feed Slide
- 13 Thread Measure Slide
Block Pivot Stud
- 14 Thread Measure Adjust-
ing Slide
- 15 Needle Guide, Needle
Segment
(See Note 3)
- 16 Bobbin Case
(See Note 2)
- 17 Guide Arm Pivot Stud

—KEY—

LUBRICANT	ALL TEMPERATURES	INTERVALS
OE—Lubricating Oil, Internal Combustion Engine	OE-50	Every 4 hours

NOTES:

1. CAMS—Clean cam races if gritty. Lubricate by applying OE-50 with soft brush.

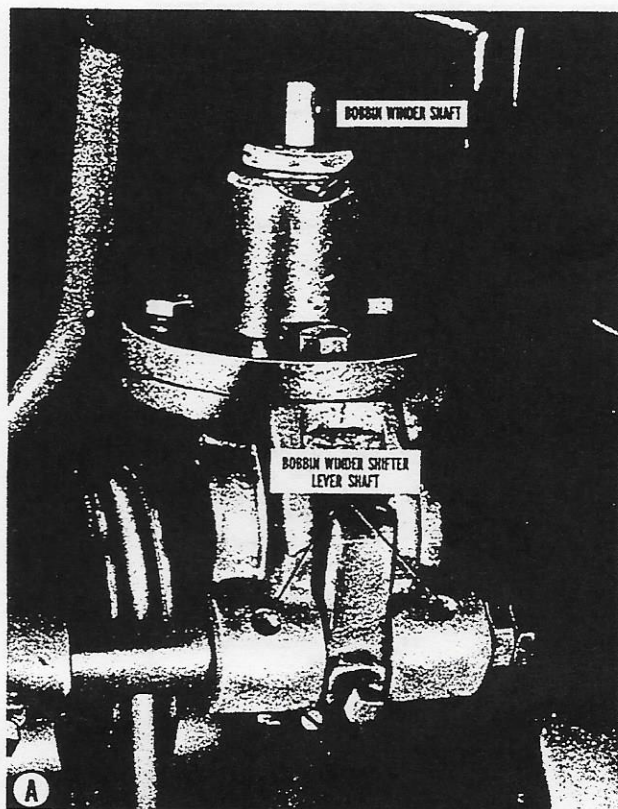
2. SHUTTLE CASE—Each time bobbin is refilled and bobbin case replaced, fill shuttle case oilcup and add a few drops of oil to face of shuttle. Twice daily remove shuttle ring and clean ring and shuttle. Reassemble and lubricate.

3. NEEDLE GUIDE, NEEDLE SEGMENT AND AWL SEGMENT—Each time bobbin is replaced lubricate these parts with a few drops of oil.

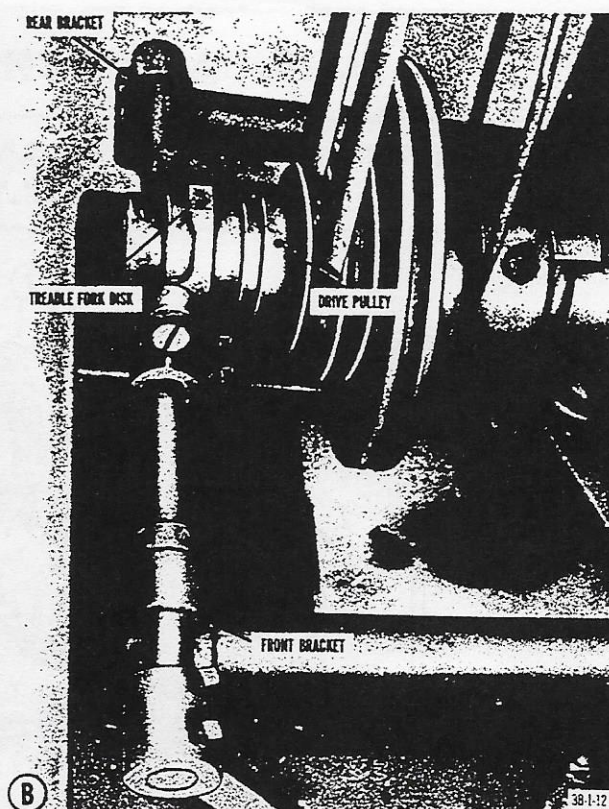
4. MOVING PARTS—In addition to points noted on chart all other moving parts should be lubricated twice daily with OE-50.

38-1-148

Figure 11—Continued.



A—Bobbin winder



B—Drive pulley, front and rear brackets, and fork disk

Figure 12. Additional lubrication points.

from shuttle ring (4) and remove ring.

- (5) Remove shuttle (5).
- (6) Clean all parts thoroughly with SD, making sure that all wax is removed.
- (7) Clean shuttle case (18).
- (8) Rewind bobbin and lubricate (par. 35).
- (9) Replace parts by reversing procedure in (1) through (5) above.

b. *Thread Tension Assembly.* Refer to figure 13, and proceed as follows:

- (1) Remove adjusting disk lock disk (17).
- (2) Remove tension spring adjusting disk (15).
- (3) Remove tension spring (14) by sliding it off thread tension stud (16).
- (4) Remove tension release collar (13) by sliding it off stud.
- (5) Loosen stud in tension release yoke (12) until it is free of stud hole in stitcher head base. Remove release

yoke; do not remove guide screws from yoke.

- (6) Remove tension spring friction disk (11) and tension wheel outside felt washer.
- (7) Slide tension wheel (10) off stud.
- (8) Clean all parts removed (except felt washer) with SD and brush. Make sure that tension wheel is completely free of wax.
- (9) Dry all parts and replace by reversing procedure in (1) through (7) above, making sure that when the tension spring adjusting disk and lock disk are replaced, only one thread of tension stud is exposed as shown in figure 13.

c. *Thread Rolls.* Refer to figure 13, and use brush and SD to clean auxiliary takeup lever thread roll (6), thread measure thread roll (7), thread lock thread roll (8), and takeup lever thread roll (9). Make sure that all wax is removed from these thread rolls.

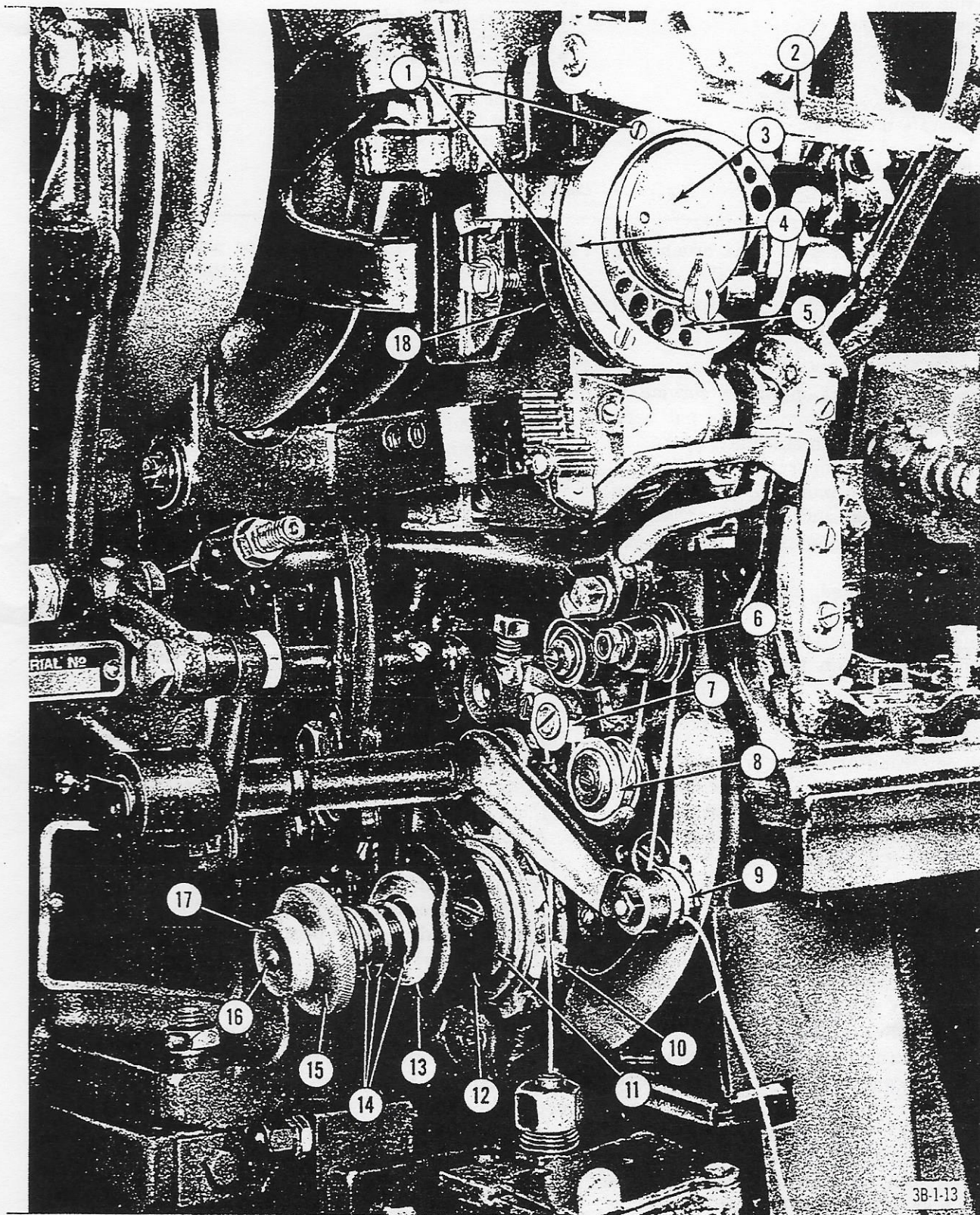


Figure 13. Points for cleaning.

- | | |
|--------------------------------------|----------------------------------|
| 1 Shuttle ring screws | 10 Tension wheel |
| 2 Bobbin case guide arm | 11 Tension spring friction disk |
| 3 Bobbin case | 12 Tension release yoke |
| 4 Shuttle ring | 13 Tension release collar |
| 5 Shuttle | 14 Tension spring |
| 6 Auxiliary takeup lever thread roll | 15 Tension spring adjusting disk |
| 7 Thread measure thread roll | 16 Thread tension stud |
| 8 Thread lock thread roll | 17 Adjusting disk lock disk |
| 9 Takeup lever thread roll | 18 Shuttle case |

Figure 13—Continued.

d. Overall Head Assembly. Use brush and SD to clean thoroughly all exposed parts of head assembly, including cam races and surfaces. Wipe with dry rag.

38. Before-Operation Service

The purpose of before-operation service is to determine that the equipment has not been damaged or tampered with since last operation and that it is in proper operating condition.

a. Turn on heat 30 minutes before operation—longer if unusually cold weather—so that machine will warm up during inspection and servicing.

b. Check for damaged, missing, and loose parts.

c. See that machine is properly cleaned.

d. Examine cams, cam races, and all other functional parts.

e. Make sure that wiring is in good condition.

f. Check condition of wax. Wax pot should be at least half full. Wax should be clean and yellow in color. Fill wax pot if necessary, adding hard wax until melted wax reaches proper level. Clean pot if necessary and refill. Make sure wax is melted enough before starting operation.

g. Check tension of needle and bobbin thread. When wax is hot, thread should pull easily, without binding, through thread handling parts. Adjust if necessary.

h. Turn handwheel and check to see if needle and awl are tracking properly, and that needle, awl, lifter, and looper are adjusted for proper clearance.

i. Start motor. Check clutch treadle and clutch. Step on treadle; clutch should engage smoothly and speed of machine should increase until treadle is all the way down. Machine should come to a stop when treadle is released.

j. Check presserfoot release treadle action.

Step on treadle; this should raise presserfoot, release thread tension, and lower thread lock.

k. Lubricate machine (pars. 34 and 35).

l. Inspect stitcher and bobbin winder drive belts for good condition and correct tension. Replace or adjust as necessary (par. 60).

m. Check bobbin winder action.

n. Rewind bobbin and make sure that stripper is supplying proper amount of wax for correct lubrication of thread.

o. Test shoe for proper placement of stitch and make sure presserfoot holds properly.

p. Report any unsatisfactory conditions.

39. During-Operation Service

The purpose of during-operation service is to reduce the extent of damage if trouble should occur and to keep the machine operating properly.

a. Listen for unusual noises and conditions during operation. If necessary to inspect closely, turn off motor and locate trouble by turning handwheel and observing operation of machine.

b. Check tracking of needle and awl in operation. The path of the needle should exactly enter hole made by awl.

c. Check occasionally to see that lifter and looper are holding their proper adjustments.

d. Check awl for burrs.

e. Make adjustments or replacements as necessary.

f. Oil needle segment, awl segment, needle guide, and shuttle when rewinding bobbin.

g. Add wax to wax pot as necessary; do not completely fill wax pot.

h. Clean and lubricate machine every 4 hours; turn heat to LOW while cleaning.

40. After-Operation Service

The purpose of after-operation service is to detect and correct deficiencies which developed

during operation, and to prepare machine for next operation.

- a. Turn off motor and heat.
- b. Check condition of wax. Clean out wax pot if necessary. Do not add wax; it is better to add new wax when the machine is hot during before-operation service.
- c. Clean machine thoroughly and wipe down with dry cloth.
- d. Lubricate all necessary points.
- e. Do not rewind bobbin during after-operation service; wax will harden and thread will become brittle.
- f. Correct any deficiencies within the scope of organizational maintenance.

g. Inspect head thoroughly for parts to be replaced or adjustments to be made.

h. Check cam and cam lever shaft setscrews, and retaining screws of needle clamp, awl clamp, needle guide, lifter, and looper.

i. Inspect belts for good condition and correct tension.

j. Inspect wiring to see that it is securely fastened, clean, and undamaged.

k. Check action of presserfoot treadle and clutch treadle.

l. Correct any deficiencies within the scope or organizational maintenance.

m. Report any unsatisfactory condition which cannot be corrected.

Section III. TROUBLESHOOTING

41. General

Troubleshooting information is designed to help organizational personnel quickly locate and correct any troubles that develop during operation.

42. Precautions

When trouble occurs, shut off motor before searching for cause of trouble and making corrections. If motor is left running, accidental pressure on clutch treadle may engage machine enough to injure personnel.

43. Troubleshooting Chart

Some of the more common troubles that may develop in the stitching machine, their possible causes, and suggested remedies are listed in table I.

Table I. Troubleshooting Chart, Sole Stitching Machine

Trouble	Cause	Remedy
Broken needles.	Awl is bent or burned, causing needle to punch own hole.	Replace awl.
	Needle and awl too small for thickness of work.	Use proper size needle and awl (par. 29d).
	Awl improper size for needle.	Replace with awl of correct size.
	Awl and needle out of alignment:	
	Needle loose, awl loose.	Tighten clamp screws, adjust needle and awl.
	Worn needle guide... Using wrong thread...	Replace needle guide. Replace with proper

Table I—Continued

Trouble	Cause	Remedy
	Thread too large for needle, barb of needle is pulled off as it passes through sole.	thread (par. 29d). Replace needle and adjust.
	Forcing or twisting shoe while stitching.	Do not force, retard, or twist shoe when in machine, merely guide work, holding shoe firmly.
	Improper preparation of shoe: welt not properly pressed to outsole for cement to hold, sole not tempered by soaking in water, nails in shank in path of stitches, old stitches in welts not removed, outsoles and inserts improperly shaped.	Prepare shoe properly.
	Presserfoot not holding, causing shoe to twist.	Adjust presserfoot.
	Shoe guide too far forward, covering opening in needle plate.	Adjust shoe guide with proper placement of shifter handle.
Broken thread	Thread too large for needle (if needle does not break, barb cuts into thread).	Replace with proper size thread.
	Bobbin wound too tight or too full.	Rewind bobbin.
	Needle set too close to needle guide, binding and tearing thread.	Adjust needle to 1/16 inch below needle guide.

Table I—Continued

Trouble	Cause	Remedy
	Lifter out of position, catches edge of thread.	Adjust lifter to center on needle.
	Looper out of position, loops thread on barb of needle.	Adjust looper to loop thread 1/16 inch above barb of needle.
	Auxiliary takeup does not hold thread taut when looper is to carry thread around needle.	Adjust auxiliary takeup lever and spring for proper tension.
	Burrs on thread handling parts.	Check all parts and remove burrs or replace parts.
	Bobbin case guide arm against case.	Adjust guide arm.
	Wax in poor condition, making thread brittle.	Check wax, clean and refill wax pot if necessary.
	Cold machine, gummy wax increases thread tension to breaking point.	Keep machine hot during operation.
	Thread tension too tight.	Make proper adjustment so thread pulls easily without binding.
	Thread lock will not open.	Adjust thread lock lever to open 1/16 inch below thread lock roll.
Machine locks	Frayed thread behind shuttle.	Remove shuttle and thread, and rethread as necessary.
	Thread binds between needle and needle guide.	Needle too close to guide, adjust to 1/16 inch below.
	Thread lock binds....	Adjust thread lock lever.
	Wax accumulated on thread.	Clean thread handling parts, adjust wax pot stripper or replace rubber stripper. Re-

Table I—Continued

Trouble	Cause	Remedy
	Cam lever eccentric spring broken.	thread as necessary. Refer to higher echelon.
	Thread lock adjustment made with takeup lever in wrong position.	Make adjustment with lever in lowest position.
Thread will not loop on shuttle.	Thread lifter out of line. Needle too far below needle guide.	Adjust lifter. Barb of needle should be 1/16 inch below needle guide when awl is feeding to left.
Cold machine.	Insufficient warm up time.	Start heating 30 minutes before operation.
Machine will not heat properly.	Heat control not high enough. Heat plates not set properly. Wiring broken.....	Keep heat control on HIGH during operation. Refer to higher echelon for repair. Refer to higher echelon.
Machine does not turn over at proper speed.	Clutch pedal slips....	Tighten setscrews on pedal.
	Clutch out of adjustment.	Adjust for proper action.
	Loose or worn belt....	Tighten or replace belt.
Bobbin winder will not turn.	Tire on driven pulley worn to prevent contact with idler pulley.	Adjust pulleys for contact when handle is pulled forward.
Presser foot treadle difficult to press down.	Presser foot out of adjustment.	Adjust presser foot.
Bobbin case loose.	Guide arm too far from case.	Adjust arm so it is 1/32 inch from case.
Bobbin case sticks.	Guide arm pressing against case. Shuttle and shuttle case need lubrication.	Adjust arm so it is 1/32 inch from case. Lubricate shuttle and shuttle case each time bobbin is rewound.

Section IV. OPERATOR MAINTENANCE

44. Responsibility

a. Replacements and adjustments in paragraphs 45 through 55 are the responsibility of the operator and will be performed as necessary. Services and repairs beyond those indicated should not be attempted by the operator but should be referred for higher echelon maintenance.

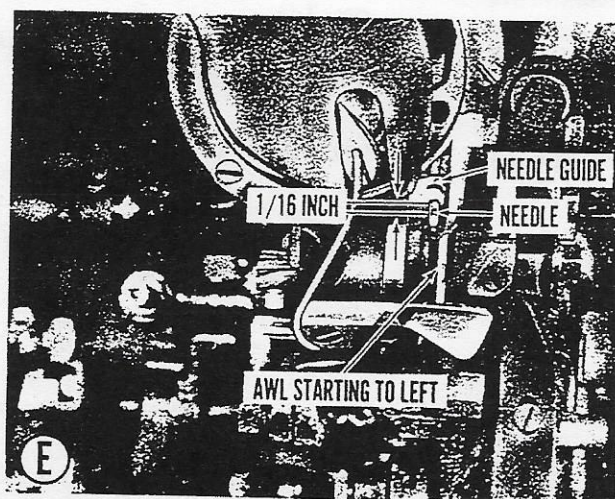
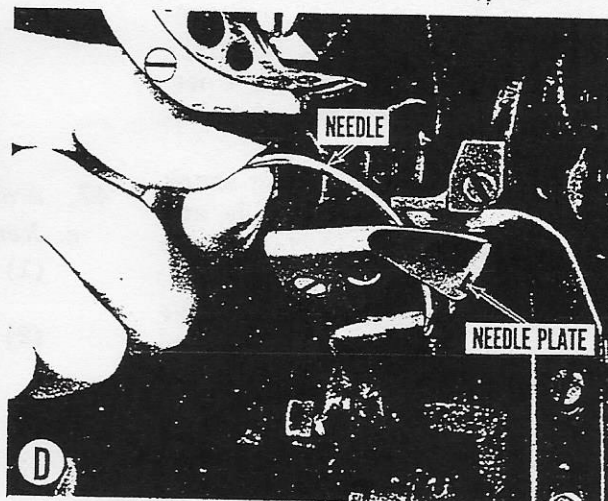
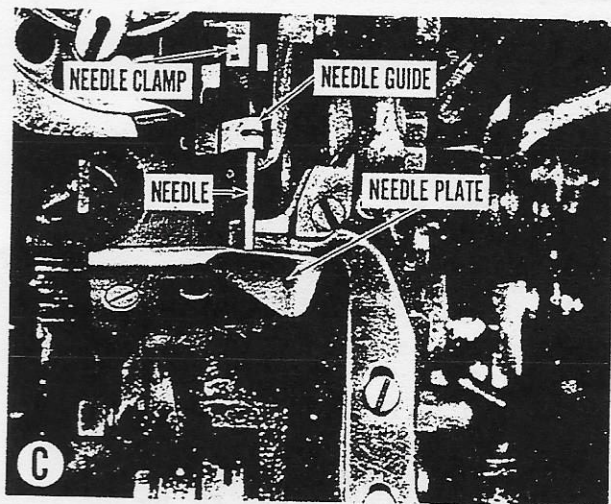
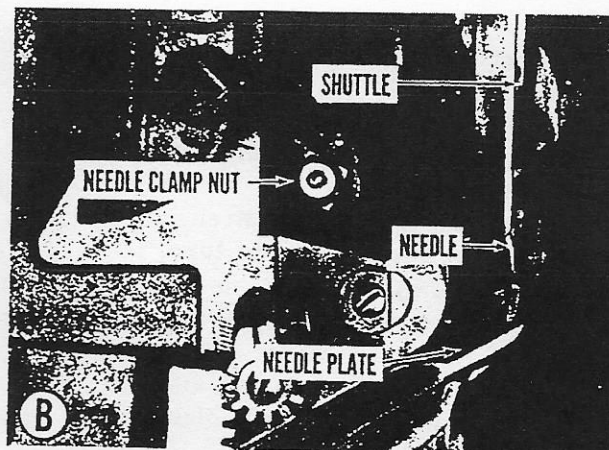
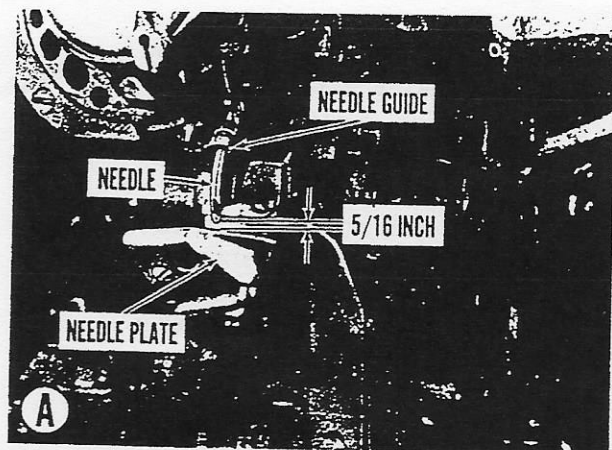
b. Services in paragraphs 45 through 55 will also be made by field and depot mechanics when

the stitcher head is assembled after complete disassembly (par. 65).

45. Needle Replacement and Adjustment

a. *Removal.* Refer to figure 14, and proceed as follows:

- (1) Turn handwheel forward so that needle is moving up while awl is down.
- (2) When needle is approximately 5/16 inch above needle plate (A), needle clamp nut can be reached through



3B-1-14

A—Needle 5/16 inch above needle plate
B—Needle clamp nut
C—Needle in clamp and needle guide

D—Removing needle from needle plate
E—Needle 1/16 inch below needle guide

Figure 14. Needle removal, installation, and adjustment.

opening between shuttle case and shuttle head (B). If needle has been broken, this setting cannot be used; turn handwheel until needle clamp nut can be seen.

- (3) Use needle and awl clamp nut wrench to loosen clamp nut 1 complete turn.
- (4) Pull needle down through needle plate until it comes out of clamp and needle guide (C).
- (5) Give needle one-half turn to left and pull needle up and out of needle plate (D).

b. Installation. Refer to figure 14, and proceed as follows:

- (1) Insert new needle down through needle plate while needle is turned to left (D).
- (2) Turn needle to right, bringing shank of needle in line with needle guide, and push needle through guide into clamp (C).
- (3) When needle is 5/16 inch above needle plate, tighten clamp nut enough to hold needle while adjustment (c below) is made.

c. Adjustment.

- (1) Turn handwheel forward until awl starts to feed (moves) to left. At this point, barb of needle should be 1/16 inch from needle guide (E, fig. 14).
- (2) If needle is not in correct position, line up needle clamp nut (a above) and loosen and set needle properly.
- (3) Tighten clamp nut securely.

46. Needle Guide Replacement and Adjustment

a. Removal.

- (1) Remove needle (par. 45a).
- (2) Use needle guide socket wrench to loosen needle guide driving segment binding screw.
- (3) Pull needle guide forward (fig. 15) to reach needle guide retaining screw.
- (4) Remove needle guide retaining screw, then remove needle guide by pushing guide to right, off dowel pins in needle guide arm.

b. Installation.

- (1) Install needle guide by setting it on dowel pins in needle guide arm.
- (2) Use needle guide socket wrench to replace needle guide retaining screw.

c. Adjustment.

- (1) Bring needle segment to its most forward position by turning handwheel to rear.
- (2) Push needle guide back against needle segment so that guide touches segment but does not bind.
- (3) Tighten needle guide driving segment binding screw.
- (4) Check adjustment by turning handwheel slowly. If machine binds, needle guide is too close. Loosen binding screw and adjust for proper operation.

47. Awl Replacement and Adjustment

a. Removal.

- (1) Move shoe guide down to right to reach awl clamp nut (A, fig. 16).
- (2) Loosen latch pin screw thumb nut (A) and push nut to rear; this will remove latch pin from shoe guide and allow shoe guide to be moved.
- (3) Turn handwheel toward rear until awl is in its highest position (E, fig. 14).
- (4) Use needle and awl clamp wrench to loosen awl clamp nut one complete turn.
- (5) Hold point of awl with left hand and turn handwheel *forward*; this will move clamp to rear, releasing awl.
- (6) Give awl one-half turn to right, and pass awl down through needle plate.

b. Installation.

- (1) Insert new awl up through needle plate while awl is turned to right; give awl one-half turn to bring in line with awl clamp.
- (2) Hold point of awl, and turn handwheel to rear until shank of awl enters awl clamp. When shank can be felt just protruding from lower end of clamp, tighten clamp nut enough to hold awl during adjustment (c below).
- (3) After adjustment, replace shoe guide as follows:

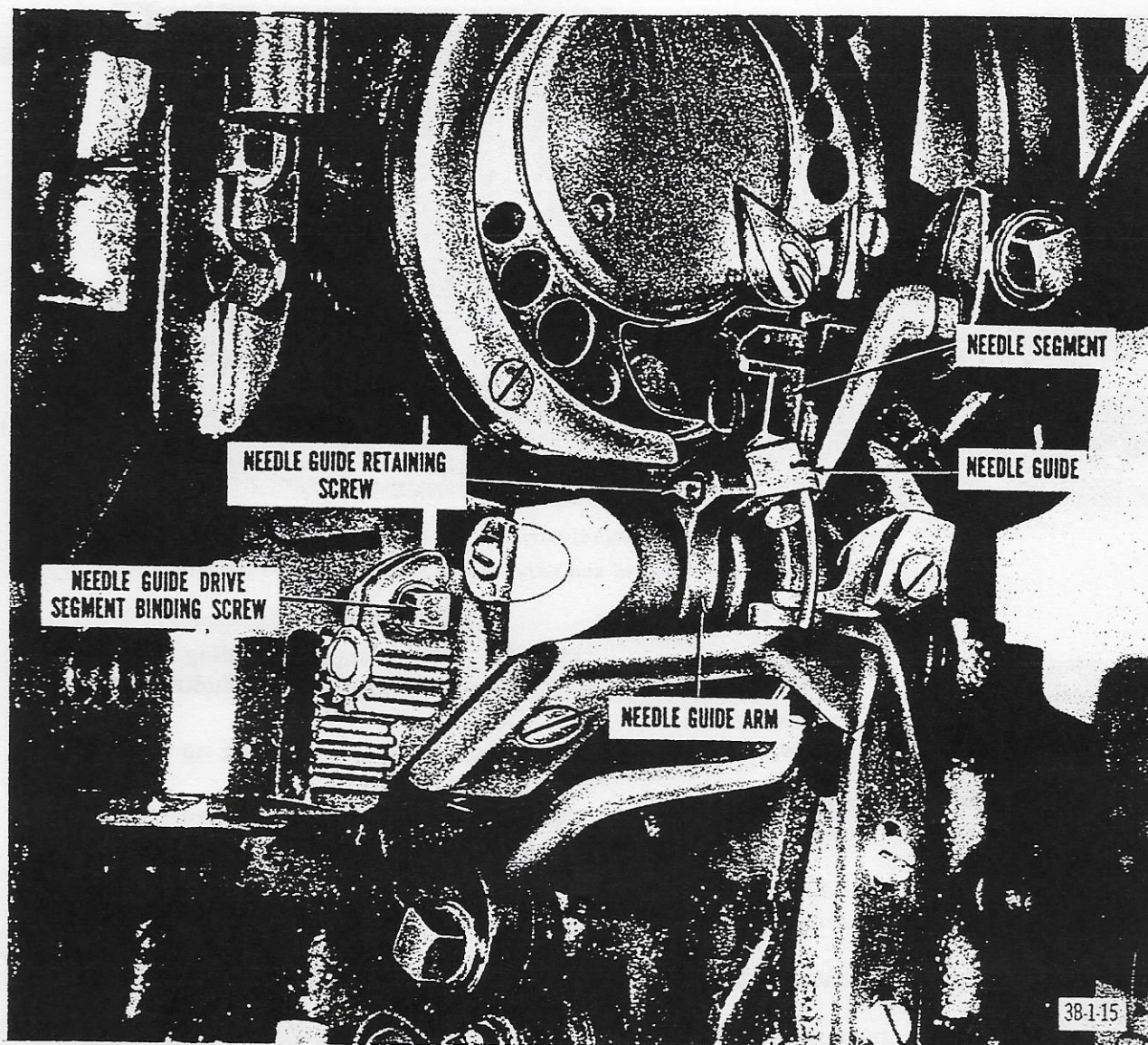
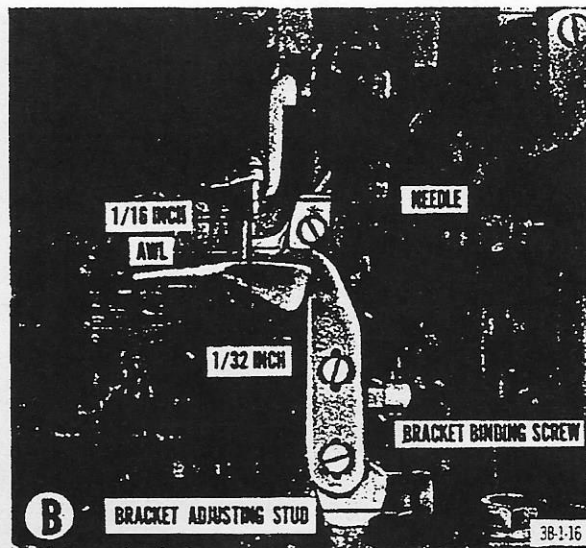
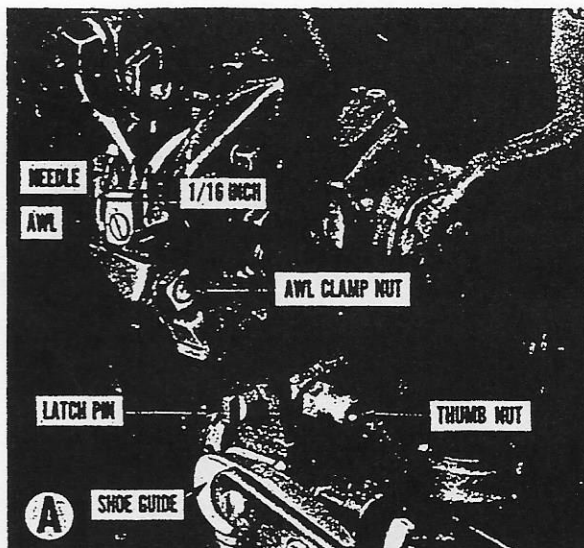


Figure 15. Needle guide removal.

- (a) Push thumb nut (A, fig. 16) to rear.
 - (b) Push shoe guide back into position.
 - (c) Release thumb nut slowly until latch pin fits into slot in rear of shoe guide.
 - (d) Tighten thumb nut.
- c. Adjustment.
- (1) Turn handwheel to rear until awl is in its highest position. At this point, awl should be $\frac{1}{16}$ inch below point of needle and $\frac{1}{32}$ inch to left of needle (B, fig. 16); if not, adjust as in (2) or (3) below.
 - (2) Adjust for $\frac{1}{16}$ inch between awl and point of needle as follows:
 - (a) Loosen awl clamp nut to move awl up or down until proper separation is obtained.
 - (b) Tighten clamp nut securely.
 - (3) Adjust for awl $\frac{1}{32}$ inch to left of needle as follows:
 - (a) With awl in its highest position, loosen feed adjusting lever bracket binding screw (B, fig. 16).
 - (b) Turn feed adjusting lever bracket adjusting stud (B, fig. 16) clock-



A—Removal B—Adjustment

Figure 16. Awl removal and adjustment.

wise to move awl to right; counter-clockwise, to left.

- (c) When adjustment is correct, tighten feed bracket binding screw.

48. Lifter Replacement and Adjustment

a. *Replacement.* Refer to figure 17, and proceed as follows:

- (1) Use lifter-looper binding screw wrench to loosen lifter binding screw (A).
- (2) Slide lifter out of eccentric stud in lifter lever.
- (3) Insert new lifter into eccentric stud.

b. *Adjustment.* Refer to figure 17, and proceed as follows:

- (1) Move lifter to left or right to center on needle (A) and pass as close as possible. Adjust by loosening binding screw and turning eccentric stud (A) until lifter clears needle.
- (2) Adjust lifter forward or backward to clear shuttle by 1/32 inch (B).
- (3) Tighten binding screw.
- (4) Turn machine slowly with handwheel to check for correct lifter clearances and position.

49. Looper Replacement and Adjustment

a. *Replacement.* Refer to figure 18, and proceed as follows:

- (1) Use lifter-looper binding screw wrench to loosen looper binding screw (A).
- (2) Remove looper by pulling up and out of looper bar.
- (3) Insert new looper into looper bar.

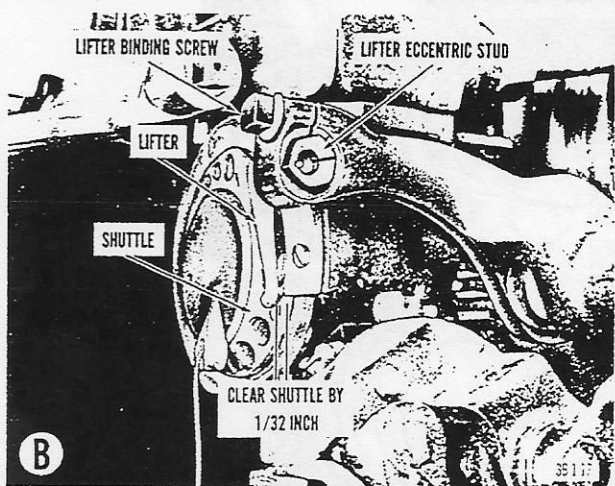
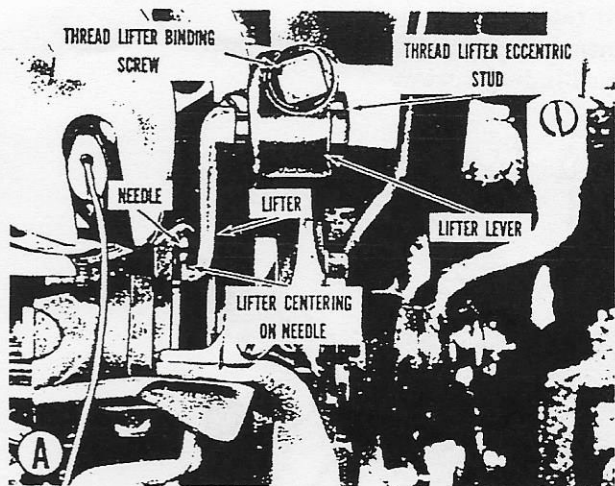
b. *Adjustment.* Refer to figure 18, and proceed as follows:

- (1) Move looper in or out of looper bar, or turn looper as necessary to set looper 1/16 inch above barb of needle (A).
- (2) Do not set looper so high that it hits thread hook as it comes forward; there should be 1/32 inch between looper and thread hook (B).
- (3) Tighten looper binding screw.

50. Thread Measure Adjustment

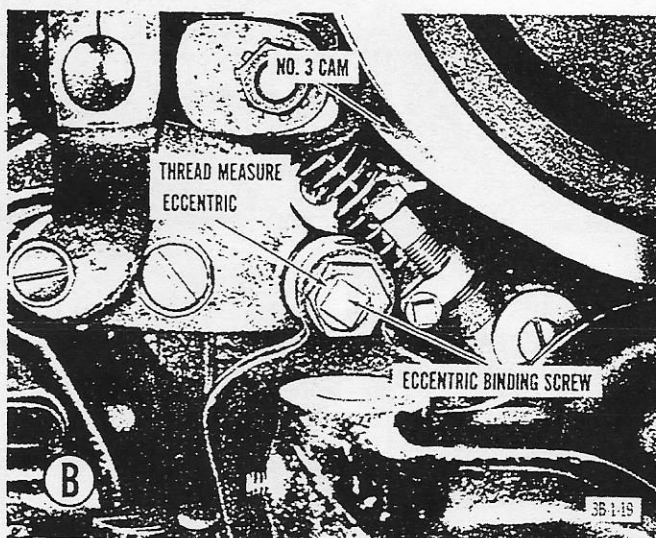
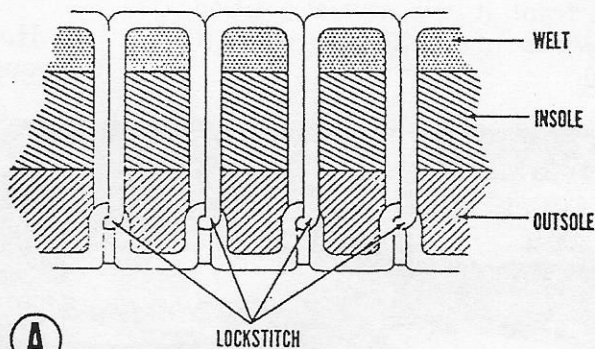
The thread measure mechanism measures the thread required to form the stitch and controls depth of thread lock in the sole. When properly adjusted, the lockstitch should be in the center of the outer sole (A, fig. 19). If stitch is not holding and examination shows lock is out of place, refer to B, figure 19, and adjust as follows:

a. Loosen thread measure eccentric binding screw.



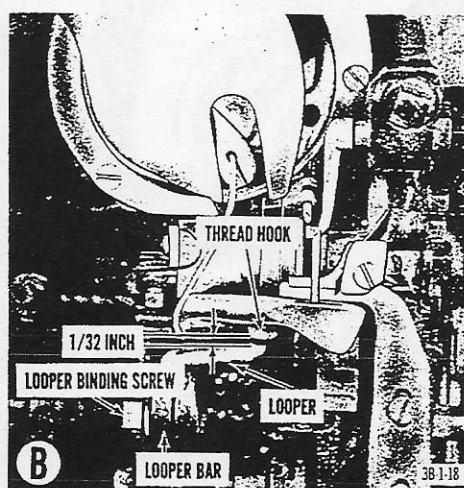
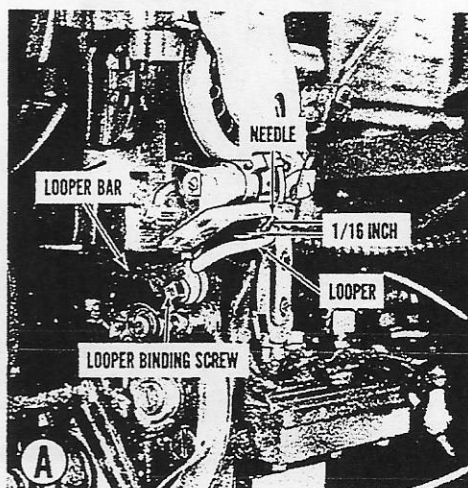
A—Lifter centering on needle
B—Lifter clearing shuttle by 1/32 inch

Figure 17. Lifter replacement and adjustment.



A—Position of thread lockstitch in sole
B—Thread measure eccentric in neutral position

Figure 19. Thread measure adjustment.



A—Looper 1/16 inch above barb of needle

B—Looper 1/32 inch below thread hook

Figure 18. Looper replacement and adjustment.

b. When narrowest side of hexagon head on eccentric is to front, it is in neutral position.

(1) If lock is on top, turn eccentric forward.

(2) If lock is on bottom, turn eccentric toward rear.

c. Hold eccentric in properly adjusted position, and tighten binding screw.

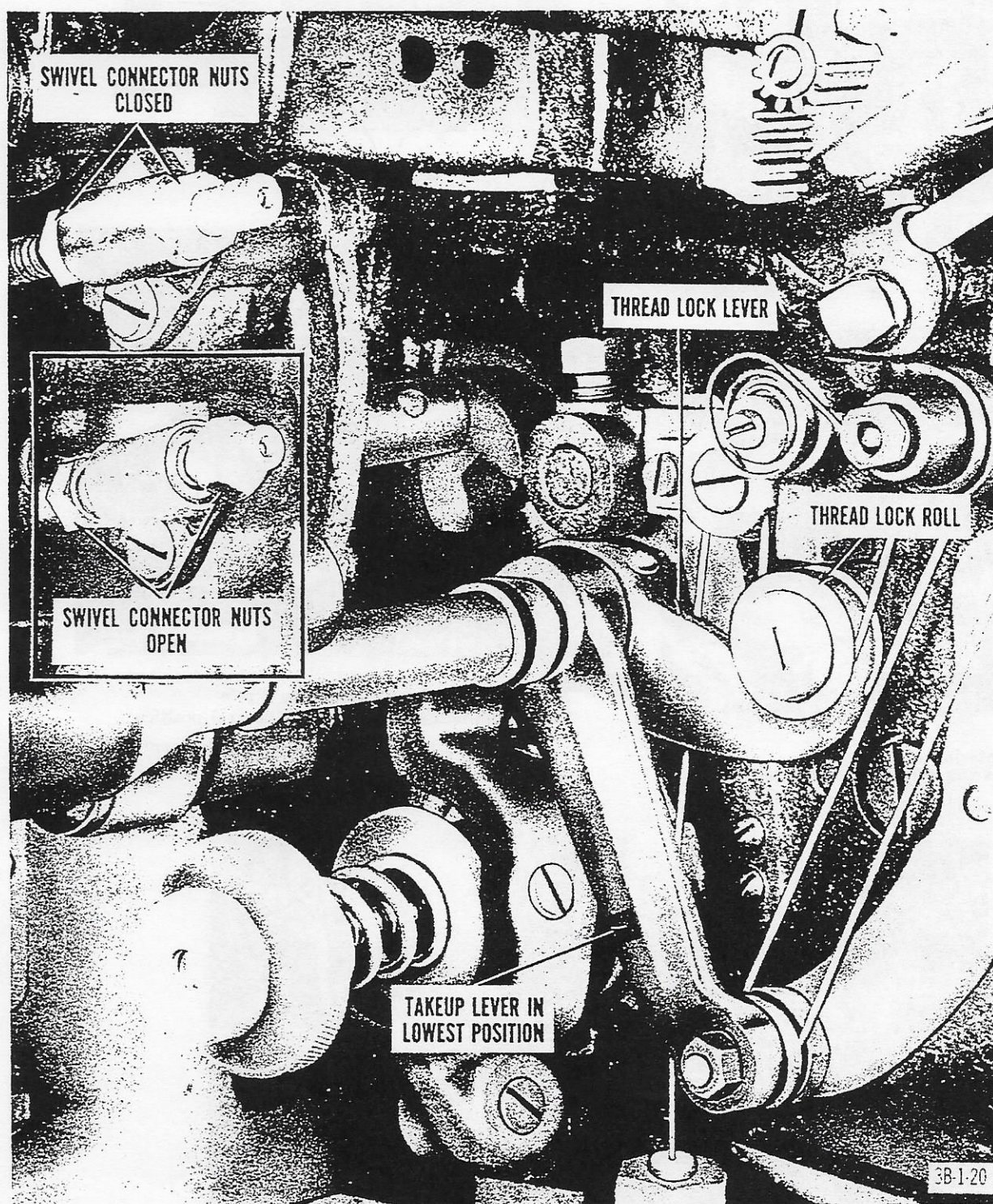


Figure 20. Thread lock adjustment.

51. Thread Lock Adjustment

The thread lock holds the feeding thread while the takeup lever is pulling the lockstitch down into the sole of the shoe. When the takeup lever starts to move upward, the thread lock lever should lower about 1/32 inch to let the thread through. If the lock will not hold or will not release on time, refer to figure 20, and adjust as follows:

- Turn handwheel to rear until takeup lever is in its lowest position.
- Relieve thread tension by loosening thread tension lock disk and adjusting disk.
- Loosen swivel connector nuts until thread can be pulled freely through machine.
- To increase pressure, tighten rear swivel connector nut.
- To decrease pressure, loosen rear nut and tighten front nut.
- Check for binding.
- Retighten tension adjusting disk and lock disk until only 1 thread of stud shows.
- Pull on thread; thread should not slip when takeup lever is in lowest position.

52. Auxiliary Takeup Lever and Spring Adjustment

a. Takeup Lever.

- The auxiliary takeup lever takes up the slack thread and holds it taut as the looper carries the thread around

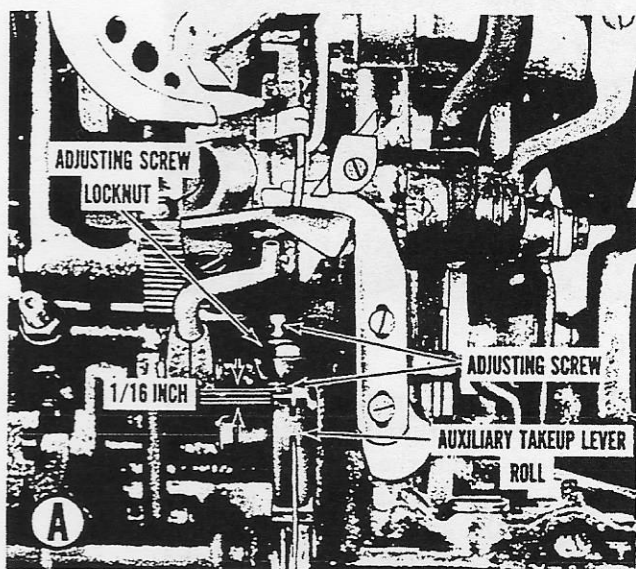
the needle. At this point, there should be 1/16 inch clearance between adjusting screw and auxiliary lever roll.

- Refer to A, figure 21, and adjust as follows:

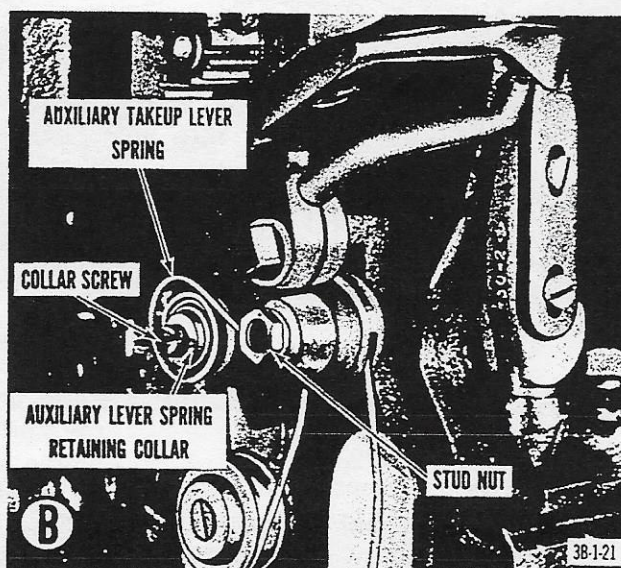
- Make sure looper is in front of needle.
- Loosen auxiliary takeup adjusting screw locknut.
- Turn auxiliary takeup adjusting screw to right or left as required for proper adjustment.
- Tighten locknut.

b. *Auxiliary Takeup Lever Spring.* The auxiliary takeup lever spring pulls the lever against the adjusting screw when the looper is not in front of the needle. If the spring is too slack, refer to B, figure 21, and adjust as follows:

- Remove stud nut from auxiliary take-up thread roll stud.
- Loosen auxiliary takeup lever spring retaining collar by turning collar screw.
- Turn coiled end of spring toward rear; not too tight, or lever will not move.
- Tighten collar screw and replace thread roll stud nut.



A—Lever adjustment



B—Lever spring adjustment

Figure 21. Auxiliary takeup lever and spring adjustment.

53. Presserfoot Adjustment

The presserfoot holds the sole of the shoe to the needle plate during operation. The presserfoot is properly adjusted when it cannot be raised by the hand lever unless the awl is in its highest position or feeding to the left. Refer to figure 22, and adjust presserfoot as follows:

a. Bring needle segment to its most forward position.

d. Tighten adjusting screw lock screw.

e. Check by stepping on presserfoot treadle.

54. Presserfoot Channel Knife Adjustment

The presserfoot channel knife cuts a channel for the thread in a leather sole. The channel knife is used only in stitching a leather sole with a short stitch. Always set the machine for a short stitch (par. 22) before setting knife; raise knife when using long stitches to prevent

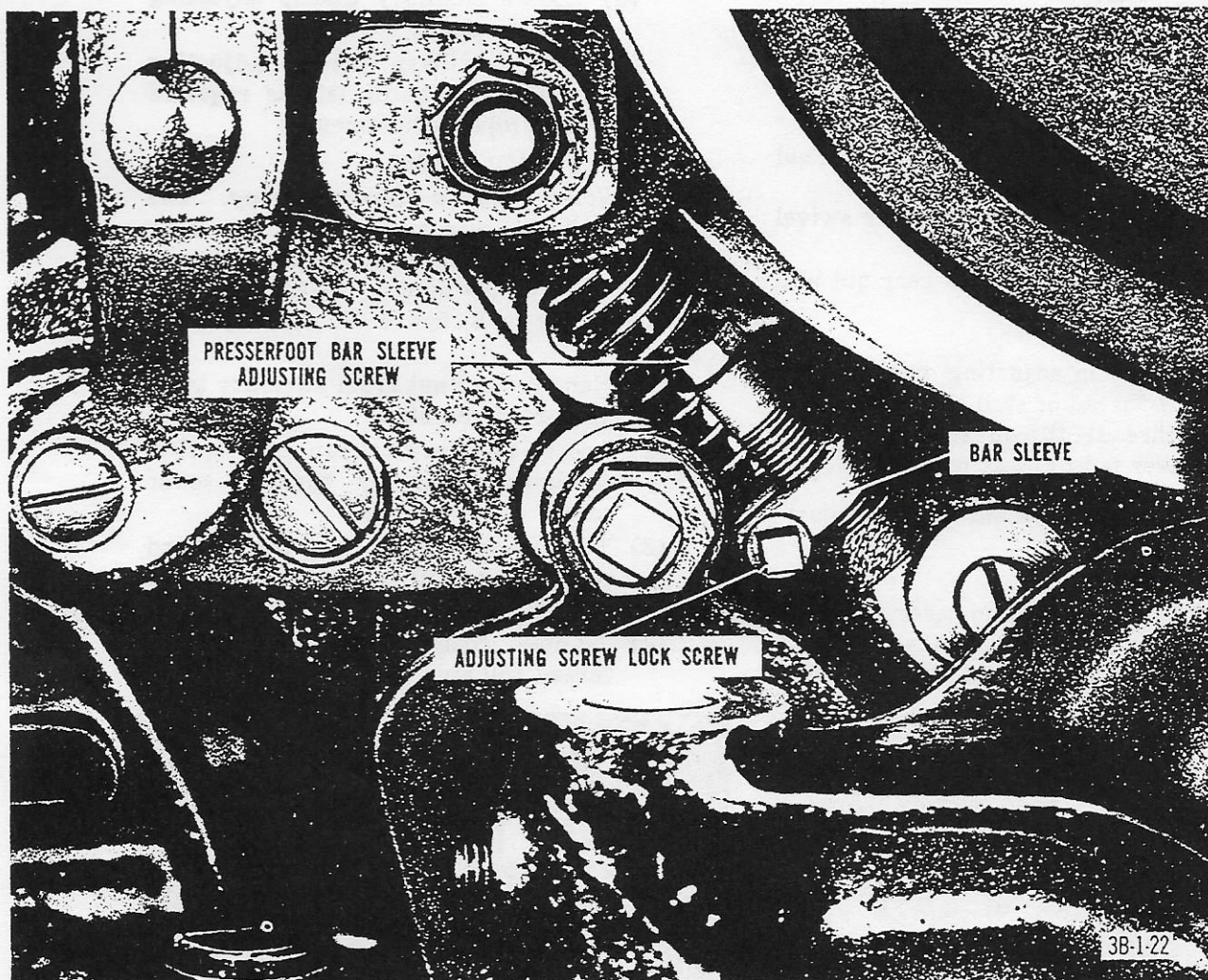
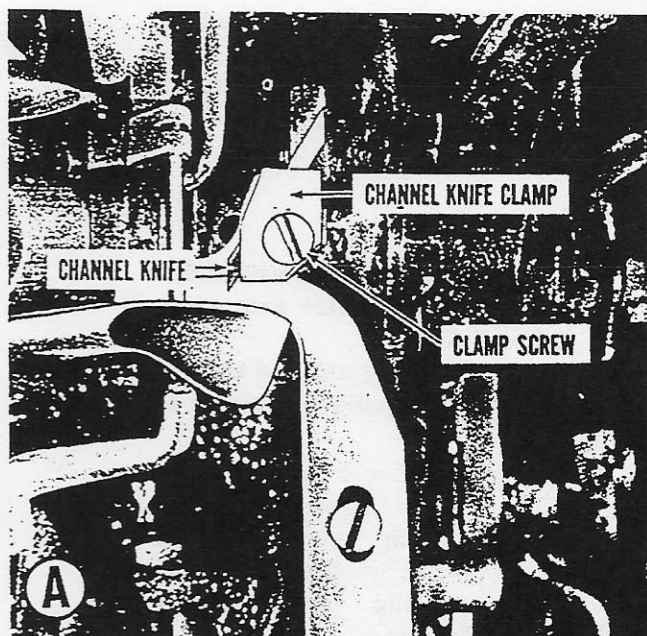


Figure 22. Presserfoot adjustment.

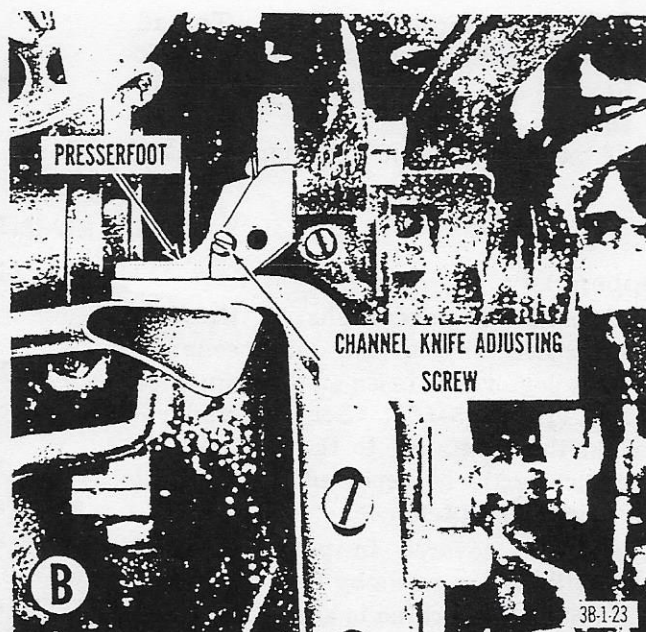
b. Loosen presserfoot bar sleeve adjusting screw lock screw.

c. To increase pressure, loosen adjusting screw; to decrease pressure, tighten adjusting screw. Do not overtighten or machine will lock.

knife or awl breakage. For short stitch use, the knife must be set so that the channel will be the same distance from the edge of the sole as the stitching, and so that it will cut a channel deep enough for the stitches to lay beneath the surface of the sole. Refer to figure 23, and adjust presserfoot channel knife as follows:



A—Up-and-down adjustment



B—In-and-out adjustment

Figure 23. Presserfoot channel knife adjustment.

a. Loosen clamp screw (A) and raise or lower channel knife as required. When knife is lowered, it should come $1/32$ to $1/16$ inch below clamp.

b. Change distance of channel from edge of sole as follows:

- (1) Remove clamp screw, channel knife, and clamp (A).
- (2) Turn adjusting screw (B) in to move channel closer to edge of sole; turn out to move channel away from edge of sole.
- (3) Replace clamp and screw.
- (4) Insert and adjust channel knife.

55. Wax Pot Stripper Replacement and Adjustment

Wax pot strippers regulate the amount of wax on the thread. Strippers should be adjusted so that the thread will pull through the stripper easily and emerge with only enough wax to keep the thread flexible. Strippers must be replaced when they can no longer be adjusted to strip the wax properly.

a. Replacement.

- (1) Use stripper nut wrench to remove binding nut (fig. 24).
- (2) Slide stripper stud off of bobbin or needle thread.

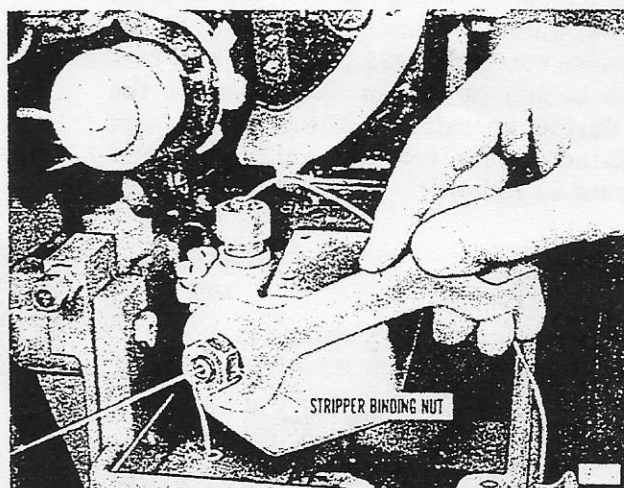


Figure 24. Adjusting wax pot stripper.

- (3) Remove rubber stripper from stripper screw, and slide stripper off thread.
- (4) Place thread through new rubber stripper and install stripper in stripper screw.
- (5) Thread stripper stud and binding nut.
- (6) Fit stripper stud over stripper and screw binding nut on stripper screw.

b. Adjustment.

- (1) Use stripper nut wrench to tighten binding nut 1 or 2 turns (fig. 24).

- (2) Pull thread through stripper. Thread should have enough wax to make it flexible but not enough to drip from thread.
- (3) If too much wax is apparent, tighten

binding nut until proper amount of wax is on thread.

- (4) Do not overtighten binding nut or tension will break thread.

Section V. UNIT MAINTENANCE

56. Responsibility

a. Adjustments in paragraphs 57 through 60 are the responsibility of the unit mechanic, who may also perform adjustments assigned to the operator (pars. 45-55). Services and repairs beyond those detailed to the operator or unit mechanic should be reported for referral to higher echelon maintenance.

b. Adjustments covered in paragraphs 45 through 60 will also be made by field and depot mechanics when the machine is assembled after complete disassembly.

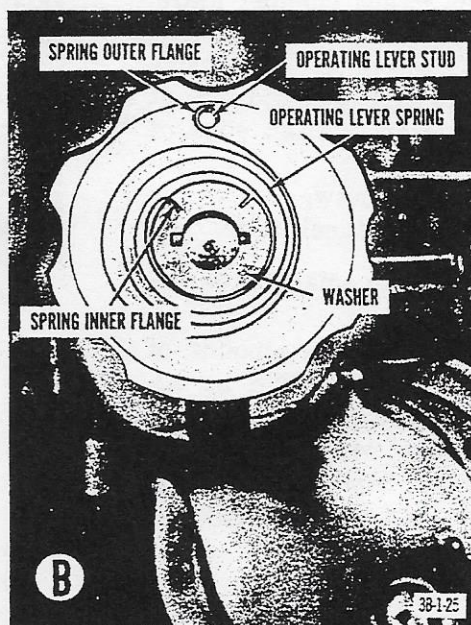
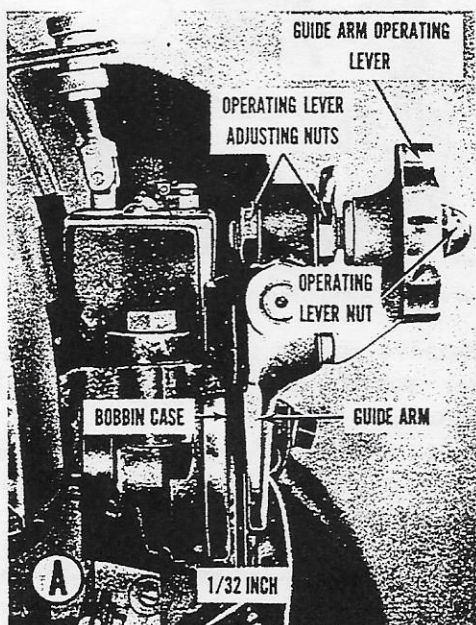
57. Bobbin Case Guide Arm Adjustments

a. *Guide Arm.* Proper spacing between the bobbin case guide arm and bobbin case (A, fig. 25) provides correct thread clearance and prevents the bobbin case from falling out of the shuttle during operation. Adjust guide arm for 1/32-inch space between guide arm and bobbin case as follows:

- (1) Loosen front adjusting nut and tighten rear nut to move guide arm away from bobbin case.
- (2) Loosen rear adjusting nut and tighten front nut to bring guide arm closer to bobbin case.

b. *Guide Arm Operating Lever Spring.* The guide arm operating lever is kept in its holding position (A, fig. 25) by an operating lever spring (B). Constant use of the lever may cause slackening in the spring. Adjust spring for proper tension as follows:

- (1) Remove operating lever nut (A) and spring retaining plate.
- (2) Tighten spring (B) by removing flange on inside of spring from left slot in washer and placing in right slot.
- (3) If procedure in (2) above does not tighten spring sufficiently, remove spring and reverse washer so slots



A—Guide arm and lever with adjusting nuts

B—Guide arm operating lever spring

Figure 25. Bobbin case guide arm adjustments.

are at bottom. Place hook on outside of spring on stud of operating lever, and put inside flange of spring in right hand slot of washer.

- (4) Replace spring retaining plate and operating lever nut.

58. Bobbin Winder Adjustment

The bobbin winder (fig. 26) is activated by an idler pulley making contact with a rubber tire on a driven pulley which turns the shaft. Use of the winder will eventually wear enough rubber from the driven pulley tire to decrease engagement of the pulleys and cause slippage. Refer to figure 26, and adjust bobbin winder as follows:

- a. Loosen shifter handle retaining screw one complete turn.
- b. Engage shifter handle by pulling forward.
- c. Loosen shifter handle shaft locknut.
- d. Tighten tension nut until idler pulley properly engages driven pulley to turn bobbin winder shaft.
- e. Tighten shifter handle retaining screw.
- f. Disengage handle and tighten locknut.

59. Clutch Adjustment

Refer to figure 27, and adjust stitcher clutch for proper engagement as follows:

- a. Loosen setscrews on stitcher drive pulley set collar.
- b. Move set collar in until there is a 3/16-inch clearance between stitcher drive pulley disk and bobbin winder pulley disk when clutch is not engaged.
- c. Tighten drive pulley setscrews and test clutch for proper engagement.

60. Belt Replacement and Adjustment

a. *General.* The two drive belts of the stitching machine are both turned by the drive shaft. One belt operates the head assembly; the other, the bobbin winder. The 1½- by 98-inch, V-type head assembly (or stitcher drive) belt is attached to the handwheel and turns the camshaft. The 5/16- by 56½-inch, round, leather, bobbin winder drive belt is attached to the idler pulley which turns the bobbin winder shaft. These belts must be kept properly adjusted for efficient operation of the machine, and belts should be replaced when cut or frayed.

b. *Adjustment.* When an old belt is being tightened or a new belt installed, observe procedures in (1) through (3) below. Check to assure that the stitcher drive pulley is in a straight line with the handwheel pulley as the stitcher head.

- (1) Allow for normal stretch which will occur after a new leather belt has been run. This stretch usually amounts to 1/8 inch for each foot of belt length. For example, if the actual measured distance around the pulleys to be connected is 6 feet, cut a new leather belt ¾ inch less than 6 feet.
- (2) Cut ends of belt square.
- (3) Points of hooks fastening ends of belt together should go to pulley side of belt. Flatten hook points so belt will not bump on pulley.

c. *Removal.*

- (1) Belts to be replaced may be cut at any point and be discarded.
- (2) Belts to be adjusted should be cut as close to hooks as possible, or hooks may be straightened and removed.

d. *Installation.*

- (1) *Stitcher drive belt.*
 - (a) Place belt around camshaft next to handwheel and around drive shaft.
 - (b) Hook ends of belt together.
 - (c) Place belt in groove of handwheel (B, fig. 1).
 - (d) Catch part of remaining slack of belt over edge of outer groove of stitcher drive pulley (fig. 27). Turn handwheel and press on belt until it works completely into stitcher drive wheel groove.
- (2) *Bobbin winder drive belt.*
 - (a) Place belt around shaft next to idler pulley (fig. 26) and in groove of bobbin winder pulley on drive shaft (fig. 27).
 - (b) Hook ends of belt together.
 - (c) Catch remaining slack of belt on edge of idler pulley. Turn pulley with one hand while gradually working belt over edge into groove.

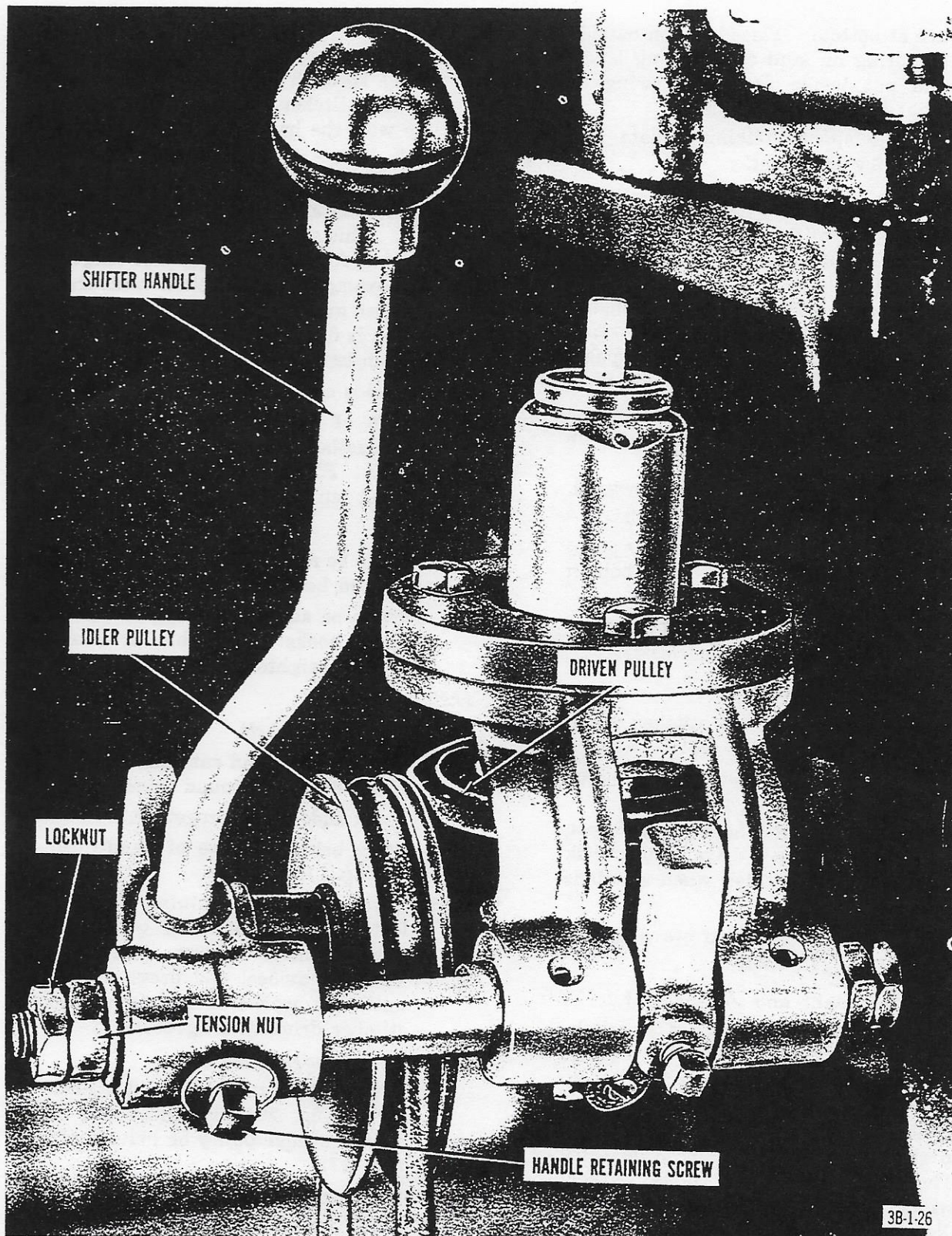
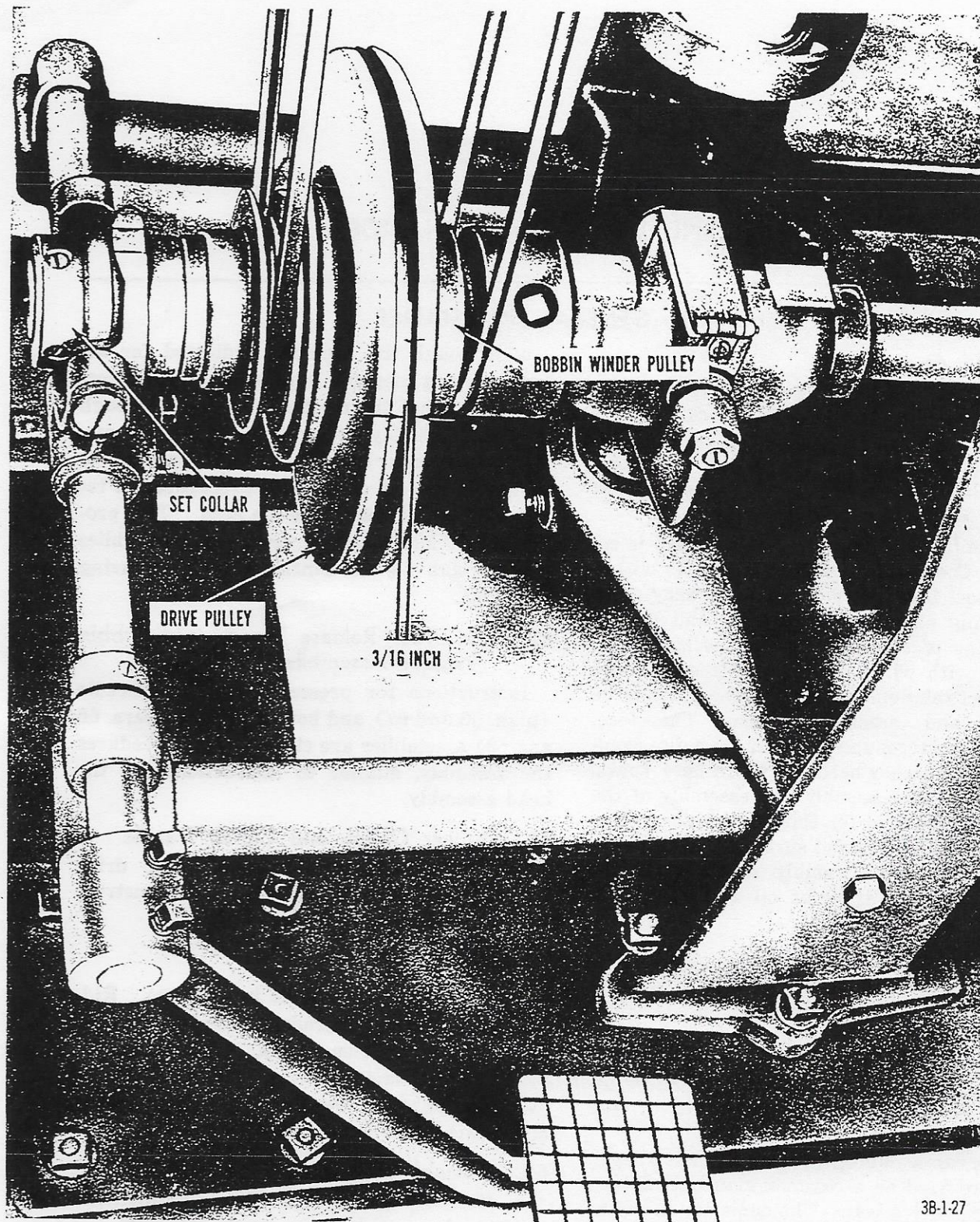


Figure 26. Bobbin winder.



3B-1-27

Figure 27. Stitcher clutch.

CHAPTER 4

FIELD AND DEPOT MAINTENANCE

Section I. GENERAL PROCEDURES

61. Head Assembly

a. The close interlocking relationship of the many parts of the stitcher head makes it impossible to remove complete subassemblies without partial or total disassembly of other subassemblies. Therefore, for repair purposes the head assembly will be completely disassembled.

b. Care in the disassembly of the head is essential. Coordination of working parts within the compact head assembly requires very accurate timing and fine adjustment, and proper functioning of the head depends *primarily* on the care with which the mechanic establishes the correct relationship between the parts as he replaces and assembles them. Therefore, step-by-step procedures—rather than disassembly—of the stitcher head are given here (pars. 64 and 65). Disassembly and assembly of the head are authorized for third and higher echelons only. Each bearing surface of all moving parts of the head assembly should be lubricated with a few drops of oil as the head is assembled.

c. Although the accuracy indicated for assembly is not essential in disassembly, it is recommended that the mechanic make a thorough study of assembly procedures. When the mechanic is familiar with assembly procedures, he should be able to effect such procedures in reverse order to disassemble the head. This procedure will keep parts of various subassemblies together and prevent confusion of parts during assembly.

62. Presserfoot Release Treadle and Bobbin Winder Assemblies

Instructions for presserfoot release treadle (pars. 66 and 67) and bobbin winder (pars. 68 and 69) assemblies are step-by-step procedures for assembly, similar to instructions for the head assembly.

63. Stitcher Clutch and Clutch Treadle

These units of the stitcher-finisher drive shaft are removed in accordance with instructions in paragraph 114.

Section II. HEAD ASSEMBLY

64. Description and Operation

a. The head assembly includes four cams designed to control the motion of cam levers which, through connecting subassemblies, directly activate the functional parts of the stitcher head.

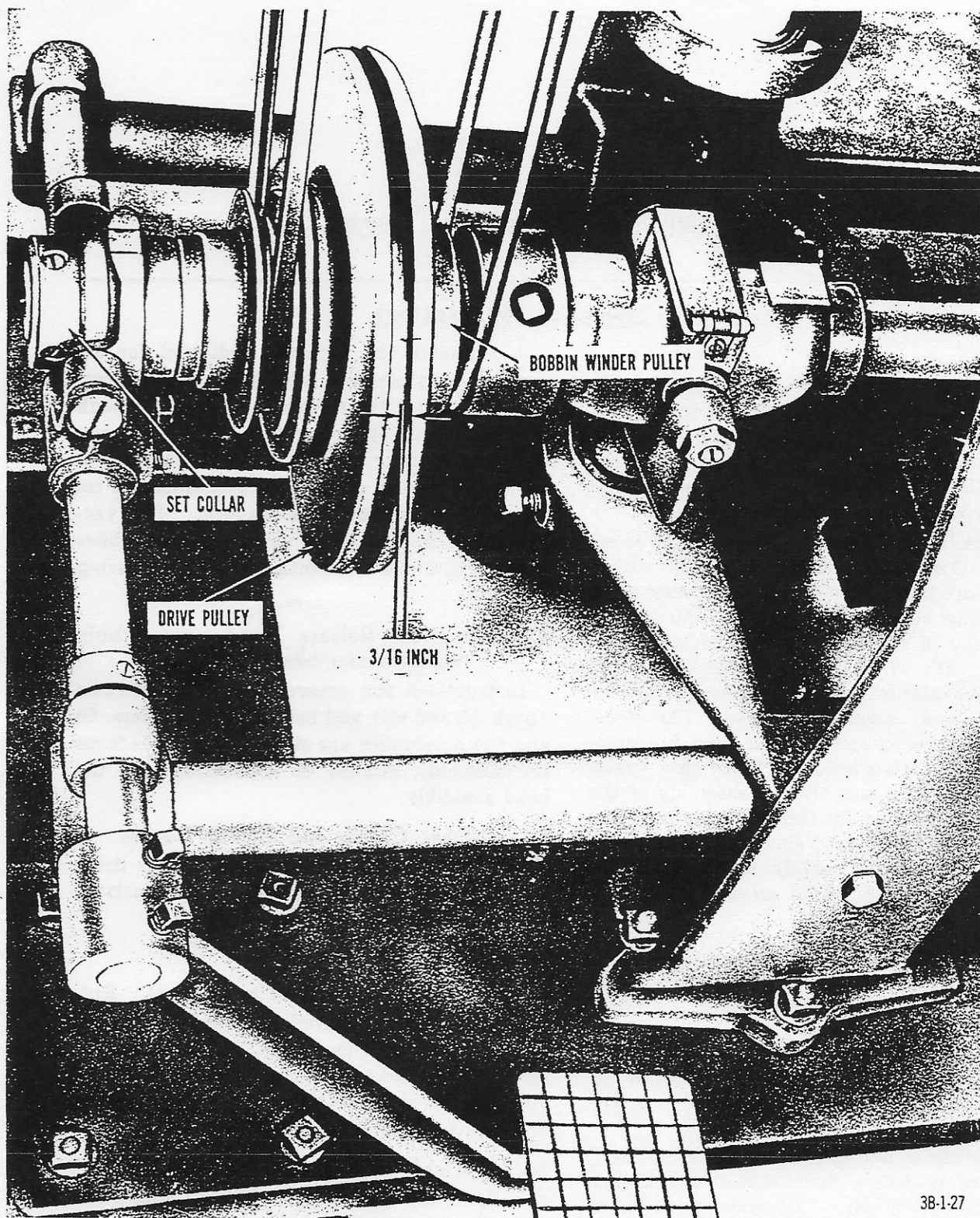
b. The cams, numbered from the left 1, 2, 3, and 4, are fixed on a common camshaft driven by a power drive belt. The cams are keyed to the shaft so that all four cams rotate with the camshaft at the same speed. Each cam has a number of grooves (cam races) machined in the sides and rims—eccentric grooves in the

sides and irregular grooves in the rims. Riding in these races are rolls attached to the cam levers. As the cams rotate, they control the action of the cam levers and the sequence of operation through the movement of the cam lever rolls in the cam races.

65. Assembly Procedure

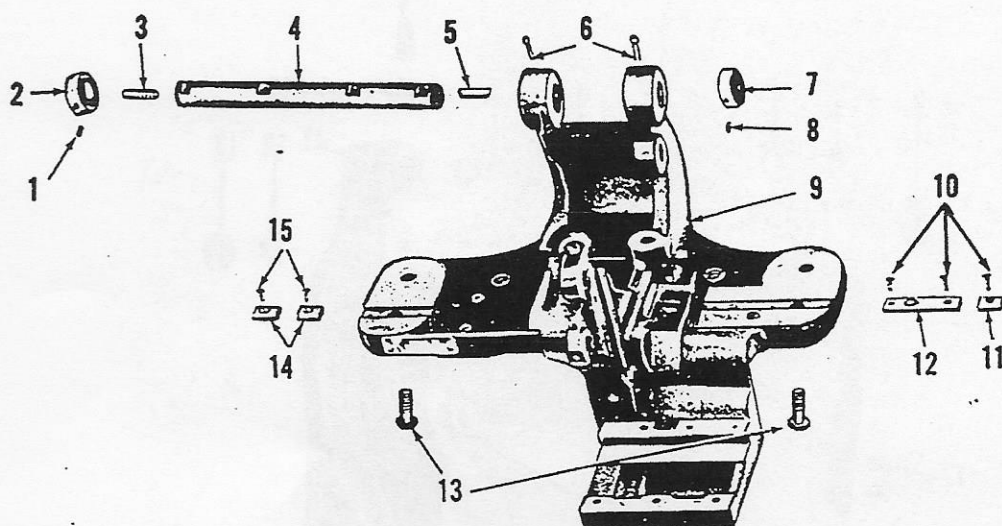
a. *Method.* The following steps indicate the method of assembling the head assembly:

- (1) Place frame (9, fig. 28) on frame of shoe repair machine and fasten with 2 locking screws (13).



3B-1-27

Figure 27. Stitcher clutch.

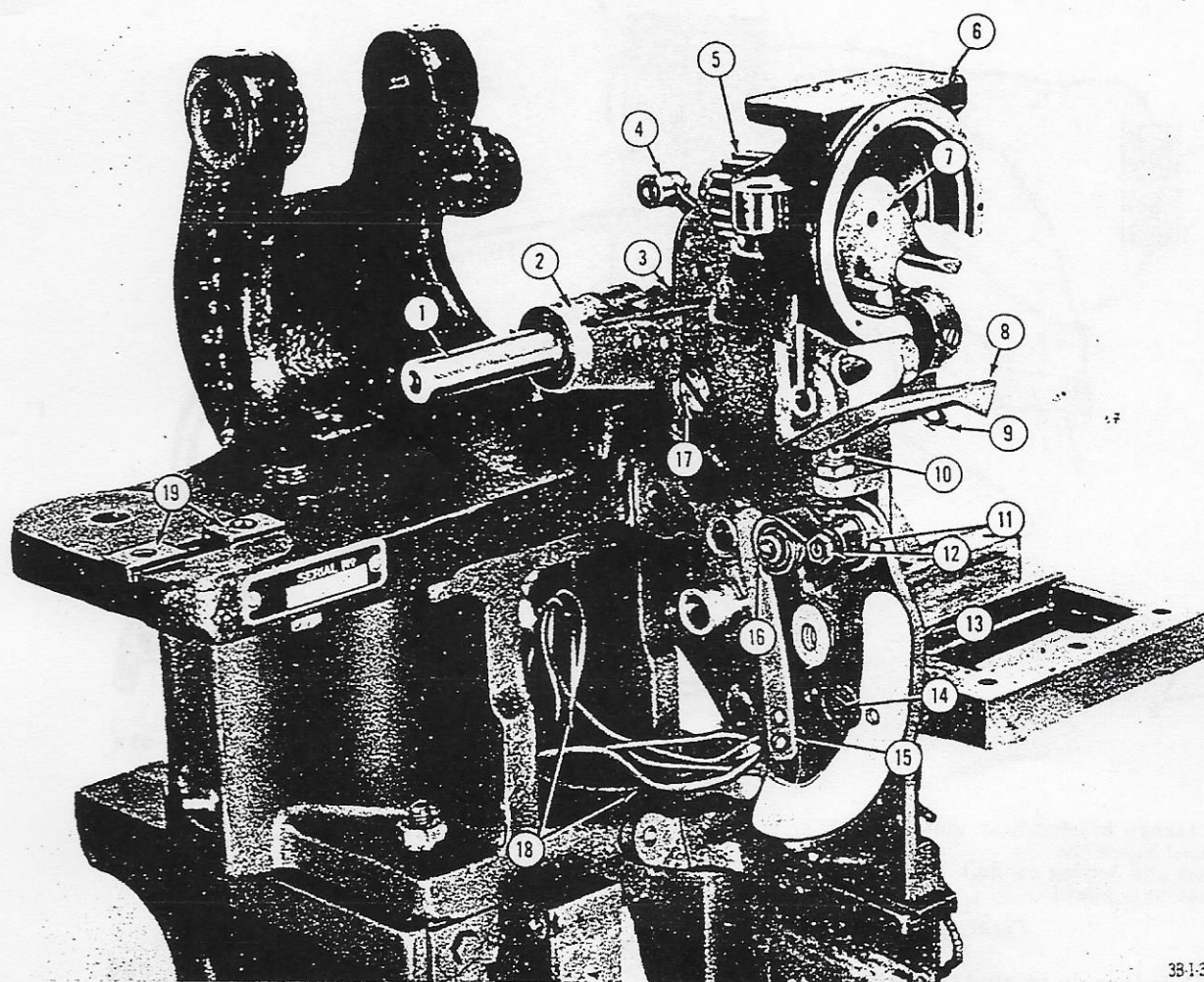


3B-1-28

- | | |
|---|---|
| 1 Cam lever shaft left collar setscrew | 9 Frame |
| 2 Cam lever shaft left set collar | 10 Camshaft right column seating key screws |
| 3 Cam lever pivot stud | 11 Camshaft right column short seating key |
| 4 Cam lever shaft | 12 Camshaft right column long seating key |
| 5 Cam cover pivot stud | 13 Locking screws |
| 6 Cam lever shaft setscrews | 14 Camshaft left column seating keys |
| 7 Cam lever shaft right set collar | 15 Camshaft left column seating key screws |
| 8 Cam lever shaft right collar setscrew | |

Figure 28. Stitcher frame, exploded view.

- (2) Fit camshaft right column long seating key (12) and camshaft right column short seating key (11) into key seats on frame, and fasten with camshaft right column seating key screws (10). Repeat procedure for 2 camshaft left column seating keys (14) and screws (15).
- (3) Place auxiliary takeup lever fulcrum stud (7, fig. 29) into auxiliary takeup bracket (11). Place fulcrum stud retaining washer (12) and stud nut (13) on fulcrum stud, and tighten nut.
- (4) Slide auxiliary takeup lever thread roll (6) on thread roll stud (8), and screw thread roll stud into auxiliary takeup lever assembly (5). Hook small curved end of auxiliary takeup lever spring (4) over thread roll stud with open end up, and install thread roll stud nut (3) on stud.
- (5) Place auxiliary takeup lever assembly on fulcrum stud with coiled end of spring centered on stud.
- (6) Place spring retaining collar (2) against spring, and place fulcrum stud retaining washer against spring retaining collar.
- (7) Insert spring retaining collar screw (1) through openings in washer, collar, and spring and into screw hole in fulcrum stud. Compress coiled end of spring slightly to eliminate slack, and tighten screw.
- (8) Place heat unit clamp (16) on auxiliary takeup bracket. Insert and tighten clamp screws (17).
- (9) Fit auxiliary takeup lever adjusting screw (9) in screw hole in auxiliary takeup bracket. Screw adjusting screwnut (10) on screw, and finger tighten nut.
- (10) Place bracket screw external tooth washer (14) on bracket screw (15), and attach auxiliary takeup bracket assembly (13, fig. 30) to frame (9, fig. 28) by inserting and tightening bracket screw (14, fig. 30).



33-1-30

- | | |
|---|---|
| 1 Shuttle head stud | 12 Auxiliary takeup lever thread roll stud nut |
| 2 Shuttle head | 13 Auxiliary takeup bracket assembly |
| 3 Shuttle head stud nut | 14 Auxiliary takeup bracket screw |
| 4 Thread hook cam roll | 15 Heat unit clamp |
| 5 Shuttle driver pinion | 16 Auxiliary takeup lever spring |
| 6 Shuttle case | 17 Shuttle head screw |
| 7 Shuttle driver | 18 Wiring from control panel to takeup bracket heat unit, wax pot heat unit, and heat control thermostat bulb |
| 8 Needle plate | 19 Camshaft left column seating keys |
| 9 Thread hook | |
| 10 Auxiliary takeup lever adjusting screw | |
| 11 Auxiliary takeup lever assembly | |

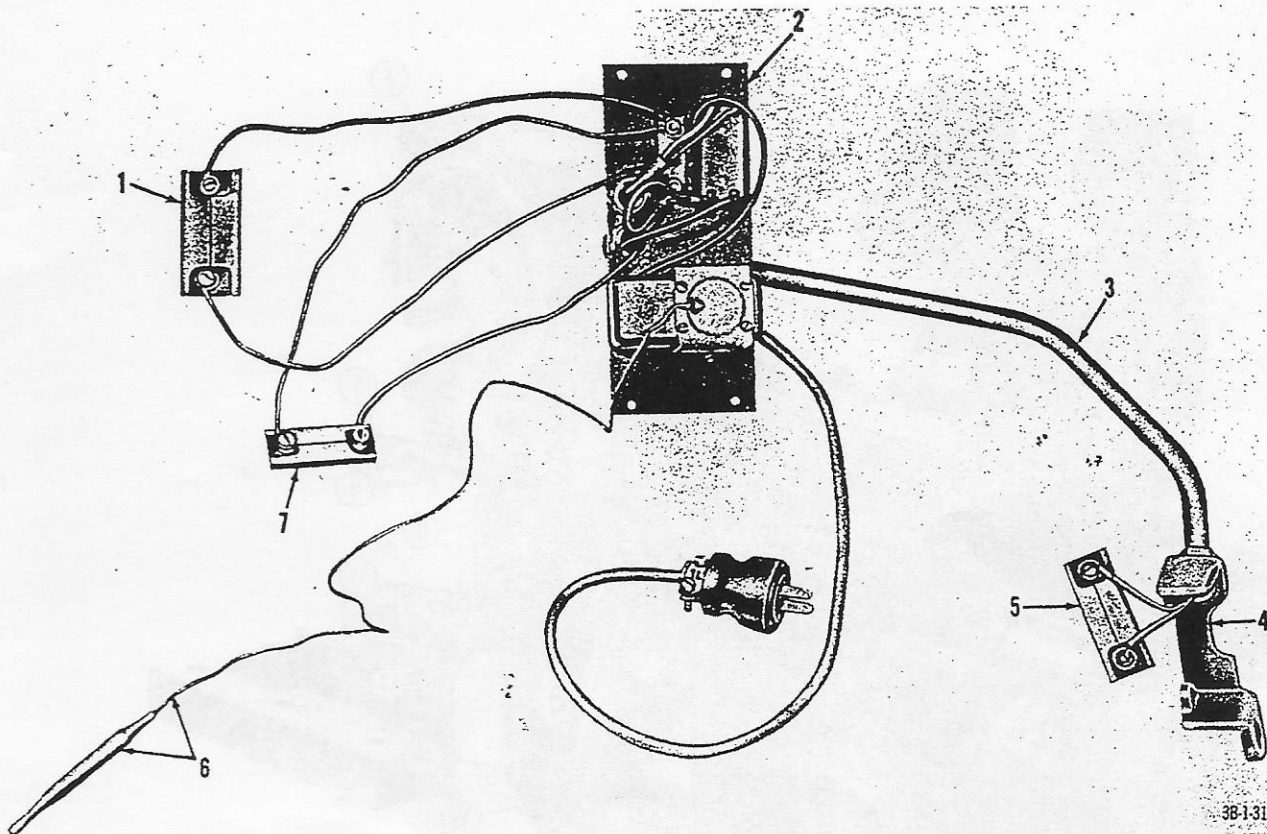
Figure 30. First stage in assembly of stitcher head.

clamp are aligned with holes in bracket.

- (15) Insert takeup heat unit clamp screws (3) through holes in clamp and into holes in bracket.
- (16) Place wax pot heat unit (8) on back of takeup bracket, and place free end of takeup bracket heat unit clamp over wax pot heat unit.
- (17) Tighten takeup bracket heat unit

clamp screw, making certain clamp holds takeup bracket heat unit and wax pot unit securely against takeup bracket.

- (18) Tap shuttle head bushing (16, fig. 33) into shuttle head (3) until bushing is flush with rear of head.
- (19) Tap needle guide driving pinion bushing (9) into shuttle head.
- (20) Fit needle segment stud setscrew



- 1 Auxiliary takeup bracket heat unit
- 2 Control panel assembly
- 3 Shuttle heat unit wiring conduit
- 4 Shuttle heat unit guard

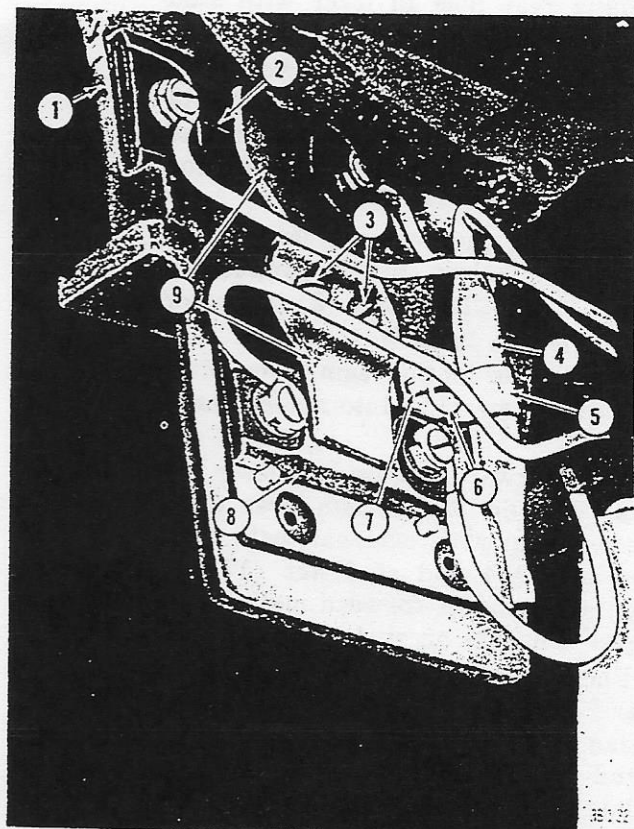
- 5 Shuttle heat unit
- 6 Thermostat bulb with tubing
- 7 Wax pot heat unit

Figure 31. Stitcher control panel and heat unit assembly.

- (17) into hole in shuttle head.
- (21) Slide shuttle case (15) on shuttle head bushing and push shuttle case until flush with shuttle head.
- (22) Aline holes in shuttle case with holes in shuttle head and insert and tighten 4 shuttle case-to-head screws (14).
- (23) Fasten needle plate (10) to bottom of shuttle head with needle plate retaining screw (13).
- (24) Slide needle plate adjusting eccentric (12) into opening in shuttle head. Fit adjusting eccentric retaining screw (11) into screw hole in shuttle head, locking eccentric in place. Tighten screw. (Some stitchers have an opening in the plate for a dowel screw and not for an eccentric; in such cases, eliminate this step.)
- (25) Place thread hook cam roll stud (5) in thread hook (6), screw thread hook

cam roll stud nut (7) on stud and tighten nut, and slide thread hook cam roll (4) on cam roll stud. Place thread hook assembly into race in shuttle head and fasten thread hook race cap (8) on shuttle head, over thread hook assembly, with thread hook race cap retaining screws (2).

- (26) Place shuttle head assembly on machine (2, fig. 30). Tap shuttle head lightly to insure flush fitting.
- (27) Fit shuttle head screw (1, fig. 33), through opening in shuttle head and into hole in frame (17, fig. 30). Tighten screw firmly.
- (28) Insert shuttle head stud (1) through openings in shuttle head and stitcher frame. Place stud nut (3) on end of stud and tighten nut securely.
- (29) Fit shuttle driver woodruff key (2,



- 1 Auxiliary takeup bracket
- 2 Takeup bracket heat unit
- 3 Takeup bracket heat unit clamp screws
- 4 Thermostat bulb
- 5 Thermostat bulb clamp
- 6 Thermostat bulb clamp screw
- 7 Thermostat bulb clamp pin
- 8 Wax pot heat unit
- 9 Takeup bracket heat unit clamp

Figure 32. Heat units on auxiliary takeup bracket.

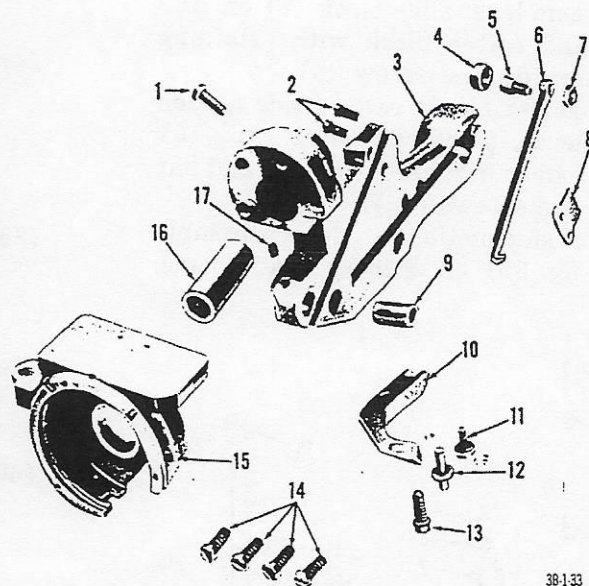
fig. 34) into key seat on shuttle driver (1).

(30) Slide shuttle driver with key installed (7, fig. 30) into bushing in shuttle head.

(31) Install shuttle driver pinion (3, fig. 34), flat washer (4), lockwasher (5), and nut (6) on shaft of shuttle driver extending from rear of shuttle head.

(32) Fit side motion cam lever roll stud (28, fig. 35) into cam lever (4), fasten with external tooth lockwasher (27) and roll stud nut (26), and fit cam lever roll (29) on stud.

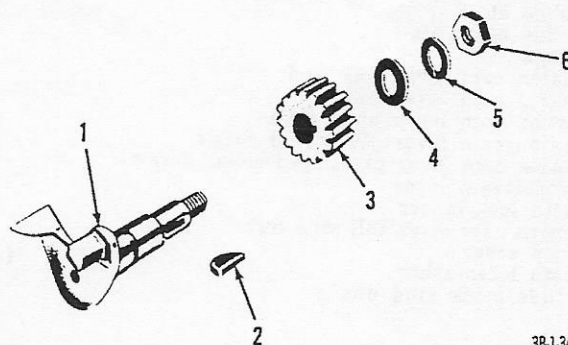
(33) Place cam lever slide block stud (8) in looper bar (21) and fasten with external tooth lockwasher (19) and cam lever slide block stud nut (20).



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- 1 Shuttle head screw
- 2 Thread hook race cap retaining screws
- 3 Shuttle head
- 4 Thread hook cam roll
- 5 Thread hook cam roll stud
- 6 Thread hook
- 7 Thread hook cam roll stud nut
- 8 Thread hook race cap
- 9 Needle guide driving pinion bushing
- 10 Needle plate
- 11 Needle plate adjusting eccentric retaining screw
- 12 Needle plate adjusting eccentric
- 13 Needle plate retaining screw
- 14 Shuttle case-to-head screws
- 15 Shuttle case
- 16 Shuttle head bushing
- 17 Needle segment stud setscrew

Figure 33. Stitcher shuttle head with thread hook and needle plate, exploded view.

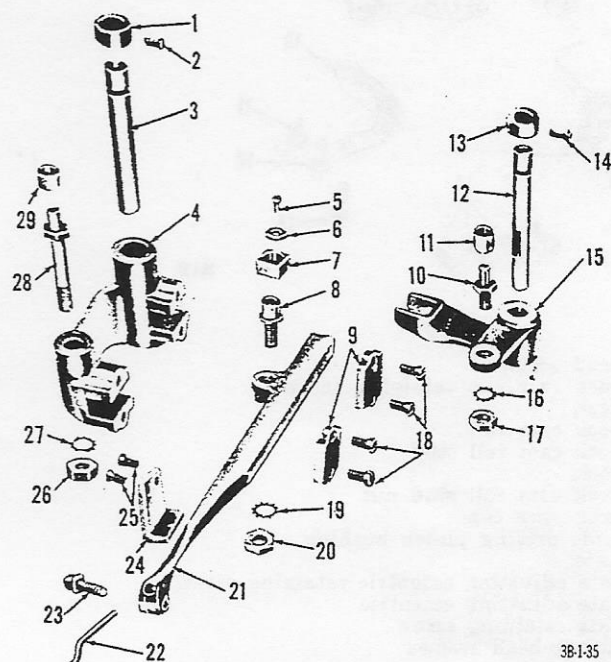


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- 1 Shuttle driver
- 2 Woodruff key
- 3 Pinion
- 4 Pinion flat washer
- 5 Pinion nut lockwasher
- 6 Pinion nut

Figure 34. Shuttle driver, exploded view.

- (34) Fit cam lever slide block (7) on stud (8) and fasten block with retaining washer (6) and screw (5).
- (35) Fit looper bar in race of side motion cam lever, place cam lever caps (9) over looper bar, and lock caps and bar with cap screws (18).
- (36) Place side motion cam lever assembly (13, fig. 36) on stitcher head frame,

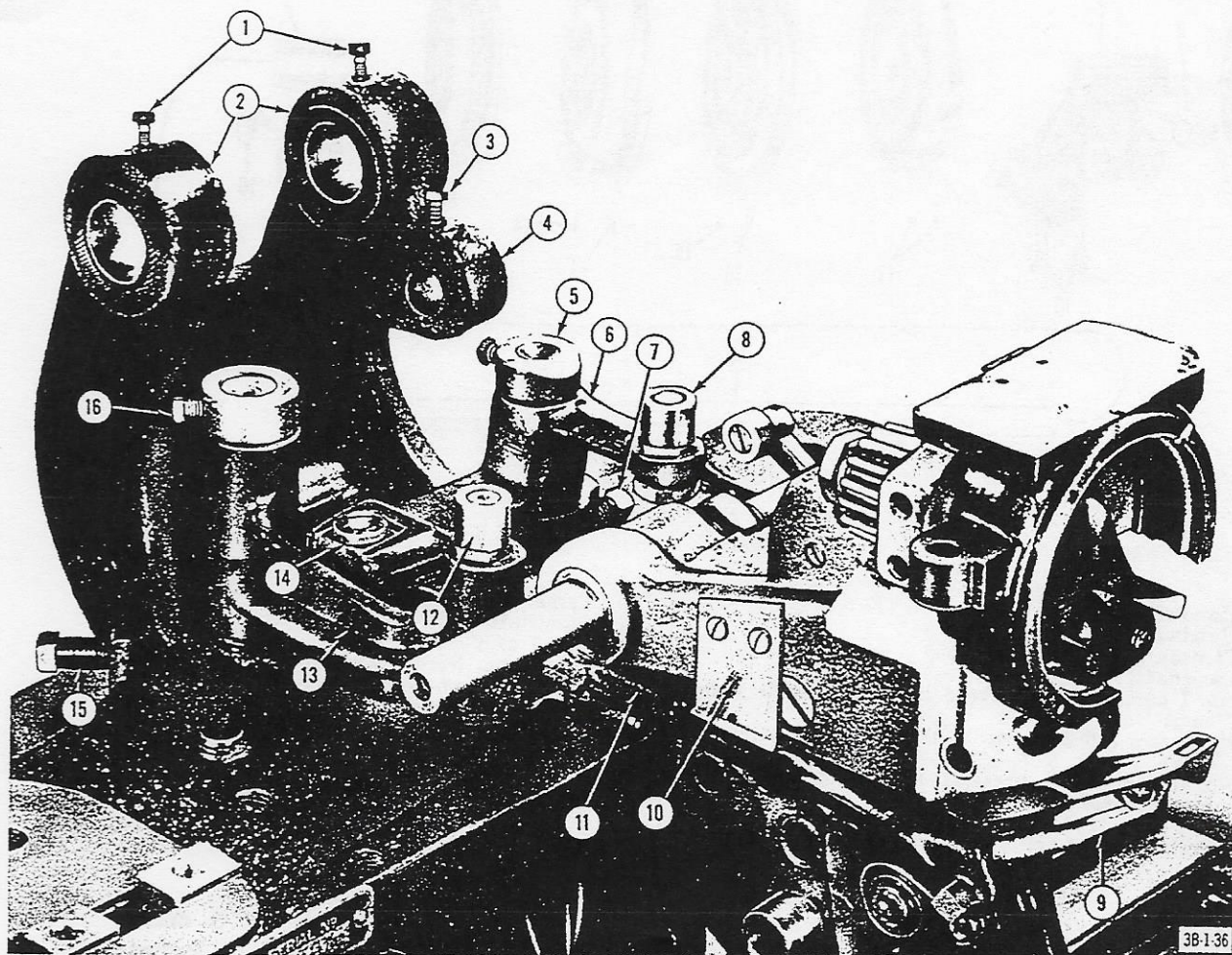


- 1 Side motion cam lever pivot stud collar
- 2 Side motion cam lever pivot stud collar screw
- 3 Side motion cam lever pivot stud
- 4 Side motion cam lever
- 5 Cam lever slide block retaining washer screw
- 6 Cam lever slide block retaining washer
- 7 Cam lever slide block
- 8 Cam lever slide block stud
- 9 Cam lever caps
- 10 Forward motion cam lever roll stud
- 11 Forward motion cam lever roll
- 12 Forward motion cam lever pivot stud
- 13 Forward motion cam lever pivot stud collar
- 14 Forward motion cam lever pivot stud collar screw
- 15 Forward motion cam lever
- 16 External tooth lockwasher
- 17 Forward motion cam lever roll stud nut
- 18 Cam lever cap screws
- 19 External tooth lockwasher
- 20 Cam lever slide block stud nut
- 21 Looper bar
- 22 Looper
- 23 Binding screw
- 24 Looper bar guide
- 25 Bar guide retaining screws
- 26 Side motion cam lever roll stud nut
- 27 External tooth lockwasher
- 28 Side motion cam lever roll stud
- 29 Side motion cam lever roll

Figure 35. Looper assembly, exploded view.

aligning rear hole in lever with stud hole in frame.

- (37) Insert side motion cam lever pivot stud (3, fig. 35) from underneath frame through opening in frame, and fit stud into rear hole in side motion cam lever.
- (38) Slide side motion cam lever pivot stud collar (1) on stud (3), and fasten collar with collar screw (2) in proper position (16, fig. 36).
- (39) Install side motion cam lever pivot stud setscrew (15) into stitcher head frame.
- (40) Place forward motion cam lever roll stud (10, fig. 35) in cam lever (15), fasten stud with external tooth lockwasher (16) and stud nut (17) on roll stud, and fit forward motion cam lever roll (11) on stud.
- (41) Place looper forward motion cam lever assembly (6, fig. 36) on stitcher head frame, aligning hole in lever with stud hole in frame. Fit cam lever slide block (14) in race in forked end of forward motion cam lever.
- (42) Insert forward motion cam lever pivot stud (12, fig. 35) through hole in lever (15) and into stud hole in frame. Install stud collar (13) and collar screw (14) on stud in proper position (5, fig. 36).
- (43) Tighten forward motion cam lever pivot stud setscrew (7) on stud.
- (44) Install looper bar guide (24, fig. 35) on shuttle head (10, fig. 36) with bar guide retaining screws (25, fig. 35). Tighten bar guide enough to hold looper bar firmly in its lowest position, but not to bind bar. This proper installation will prevent up-and-down motion of bar.
- (45) Insert looper (22) into front opening of looper bar and tighten binding screw (23) to hold looper in place.
- (46) Install headless setscrew (15, fig. 37) and squarehead setscrew (16) in No. 2 cam (6). Repeat procedure for No. 3 cam headless setscrew (13) and squarehead setscrew (14), and fit No. 4 cam setscrews (12) in hole in cam.



- | | | | |
|---|--|----|--|
| 1 | Stitcher head cam lever shaft setscrews | 9 | Looper |
| 2 | Stitcher head cam lever shaft supports | 10 | Looper bar guide |
| 3 | Presserfoot cam lever pivot stud setscrew | 11 | Looper bar |
| 4 | Presserfoot cam lever pivot stud support | 12 | Looper side motion cam lever roll |
| 5 | Looper forward motion cam lever pivot stud collar | 13 | Looper side motion cam lever assembly |
| 6 | Looper forward motion cam lever assembly | 14 | Looper cam lever slide block |
| 7 | Looper forward motion cam lever pivot stud set-screw | 15 | Looper side motion cam lever pivot stud setscrew |
| 8 | Looper forward motion cam lever roll | 16 | Looper side motion cam lever pivot stud collar screw |

Figure 36. Looper assembly installed.

(47) Fit woodruff keys (21) into key seats on camshaft (19).

(48) Slide No. 2 cam on left side of camshaft over woodruff key. Slide No. 3 cam (7) on right side of camshaft over woodruff key, then slide No. 4 cam (8) on right side of camshaft, but do not force over woodruff key at this time. Make sure cam races on No. 4 cam face left.

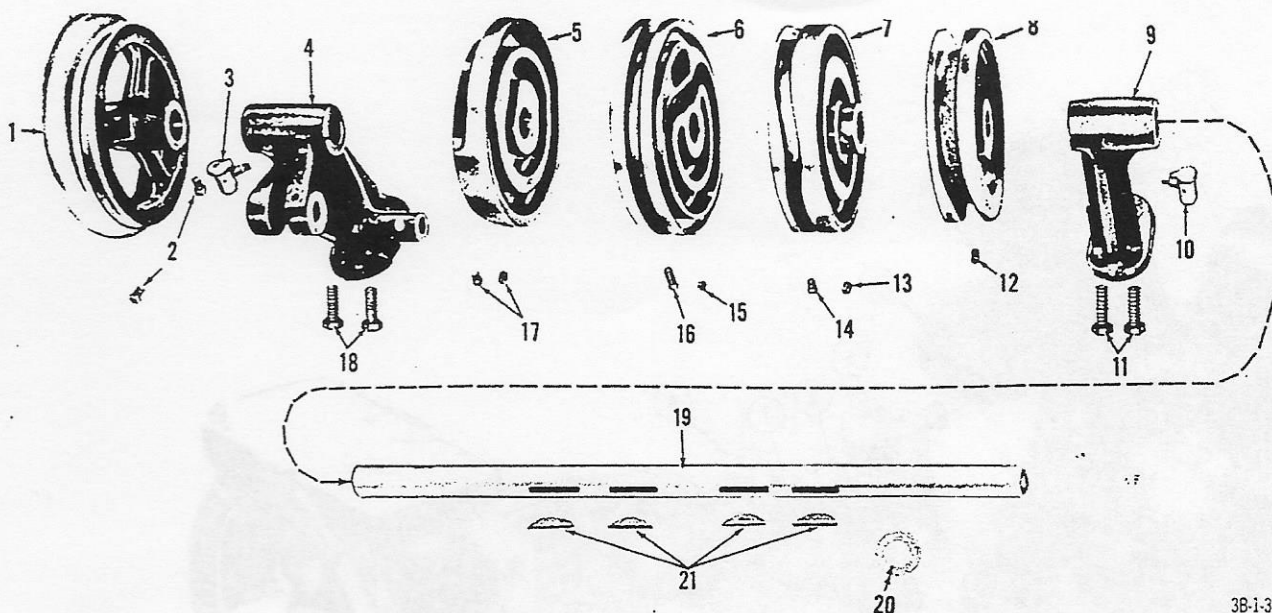
(49) Place cam lever roll stud (2, fig. 38) in hole in cam lever (3), fasten stud

with external tooth lockwasher (4) and stud nut (5), and fit cam lever roll (1) on stud.

(50) Place awl cam lever roll stud (4, fig. 39) in hole in awl cam lever (3), fasten stud with external tooth lockwasher (2) and roll stud nut (1), and fit cam lever roll (5) on stud.

(51) Fit cam lever shaft setscrews (1, fig. 36) into cam lever shaft supports (2).

(52) Fit presserfoot cam lever pivot stud setscrew (3) into stud support (4).

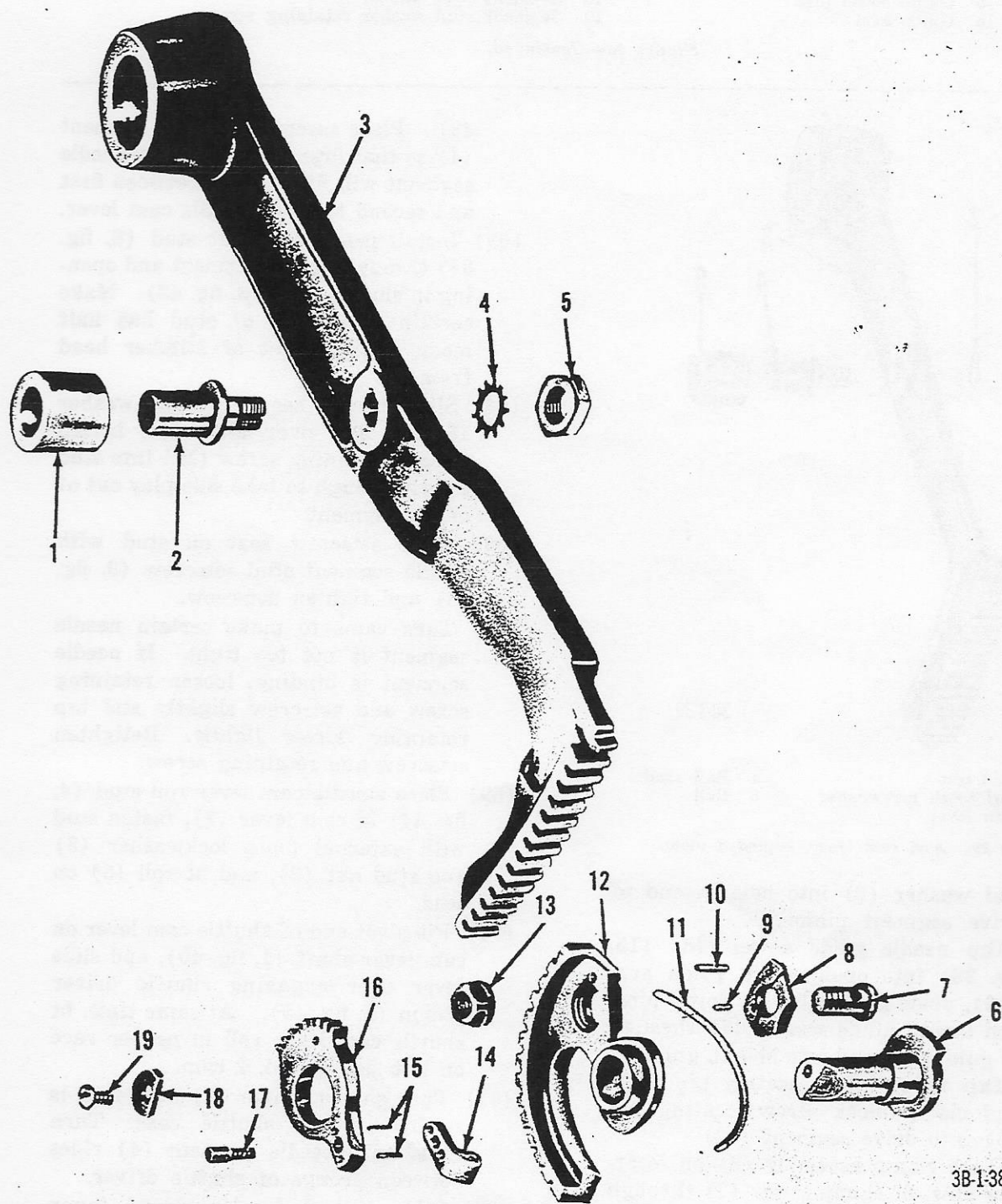


38-1-37

- | | |
|---|-----------------------------------|
| 1 Handwheel | 10 Camshaft column oiler |
| 2 Handwheel setscrews | 11 Camshaft right column screws |
| 3 Camshaft column oiler | 12 No. 4 cam setscrew |
| 4 Camshaft left column | 13 No. 3 cam headless setscrew |
| 5 No. 1 cam (takeup, thread lock, and needle guide cam) | 14 No. 3 cam squarehead setscrew |
| 6 No. 2 cam (shuttle, needle, thread hook, and looper cam) | 15 No. 2 cam headless setscrew |
| 7 No. 3 cam (awl, presserfoot, thread lifter, and looper cam) | 16 No. 2 cam squarehead setscrews |
| 8 No. 4 cam (feed and thread measure cam) | 17 No. 1 cam headless setscrews |
| 9 Camshaft right column | 18 Camshaft left column screws |
| | 19 Camshaft |
| | 20 No. 4 cam spacing washer |
| | 21 Woodruff keys |

Figure 37. Stitcher cams and camshaft, exploded.

- (53) Place needle cam lever (3, fig. 38) assembly and awl cam lever (3, fig. 39) assembly between No. 2 and No. 3 cams (6 and 7, fig. 37), fitting needle cam lever roll in race closest to shaft on right side of No. 2 cam, and awl cam lever roll in race in left side of No. 3 cam.
- (54) Place camshaft with No. 2, No. 3, and No. 4 cams, needle cam lever, and awl cam lever on stitcher head frame (fig. 40). Fit No. 2 and No. 3 cam rim races on forward and side motion looper cam lever rolls (8 and 12, fig. 33), with pivot end of needle and awl cam levers between cam lever shaft supports (2).
- (55) Fit thread hook cam roll (7, fig. 40) in cam race nearest rim on right side of No. 2 cam (9). Be sure when No. 2 cam setscrews are tightened cam clears side of thread hook by 3/64 inch. Also No. 2 and No. 3 cams should be 15/16 inch apart or looper will bind.
- (56) Slide cam lever shaft (1) through left cam lever shaft support, through pivot end of needle cam lever and pivot end of awl cam lever, and through right cam lever shaft support. Make certain setscrew seats on shaft are facing setscrew holes. Tighten cam lever shaft setscrews (1, fig. 36), then tighten cam setscrews on camshaft just enough to hold.
- (57) Slide needle guide drive segment pinion (5, fig. 41) into opening in shuttle head (fig. 42). Slide drive segment (4, fig. 41) on extended end of pinion.
- (58) Fit binding screw (3) into drive segment, fingertight.
- (59) Place retaining washer screw (1)



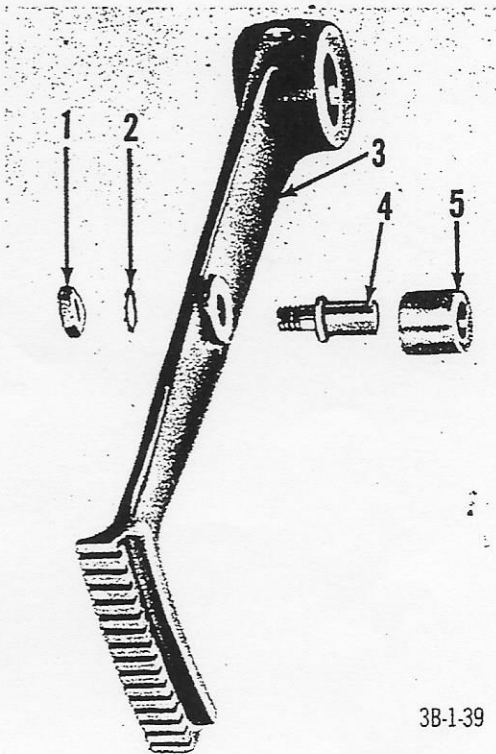
- | | |
|-----------------------------|----------------------------------|
| 1 Cam lever roll | 8 Clamp assembly |
| 2 Cam lever roll stud | 9 Clamp block screw locating pin |
| 3 Cam lever | 10 Clamp block locating pin |
| 4 External tooth lockwasher | 11 Curved needle |
| 5 Cam lever roll stud nut | 12 Drive segment |
| 6 Segment stud | 13 Clamp screw nut |
| 7 Clamp screw | |

Figure 38. Stitcher needle cam lever, drive segment, and guide, exploded view.

- 14 Guide
- 15 Guide dowel pins
- 16 Guide arm

- 17 Guide screw
- 18 Segment stud washer
- 19 Segment stud washer retaining screw

Figure 38—Continued.



3B-1-39

- 1 Roll stud nut
- 2 External tooth lockwasher
- 3 Awl cam lever
- 4 Roll stud
- 5 Roll

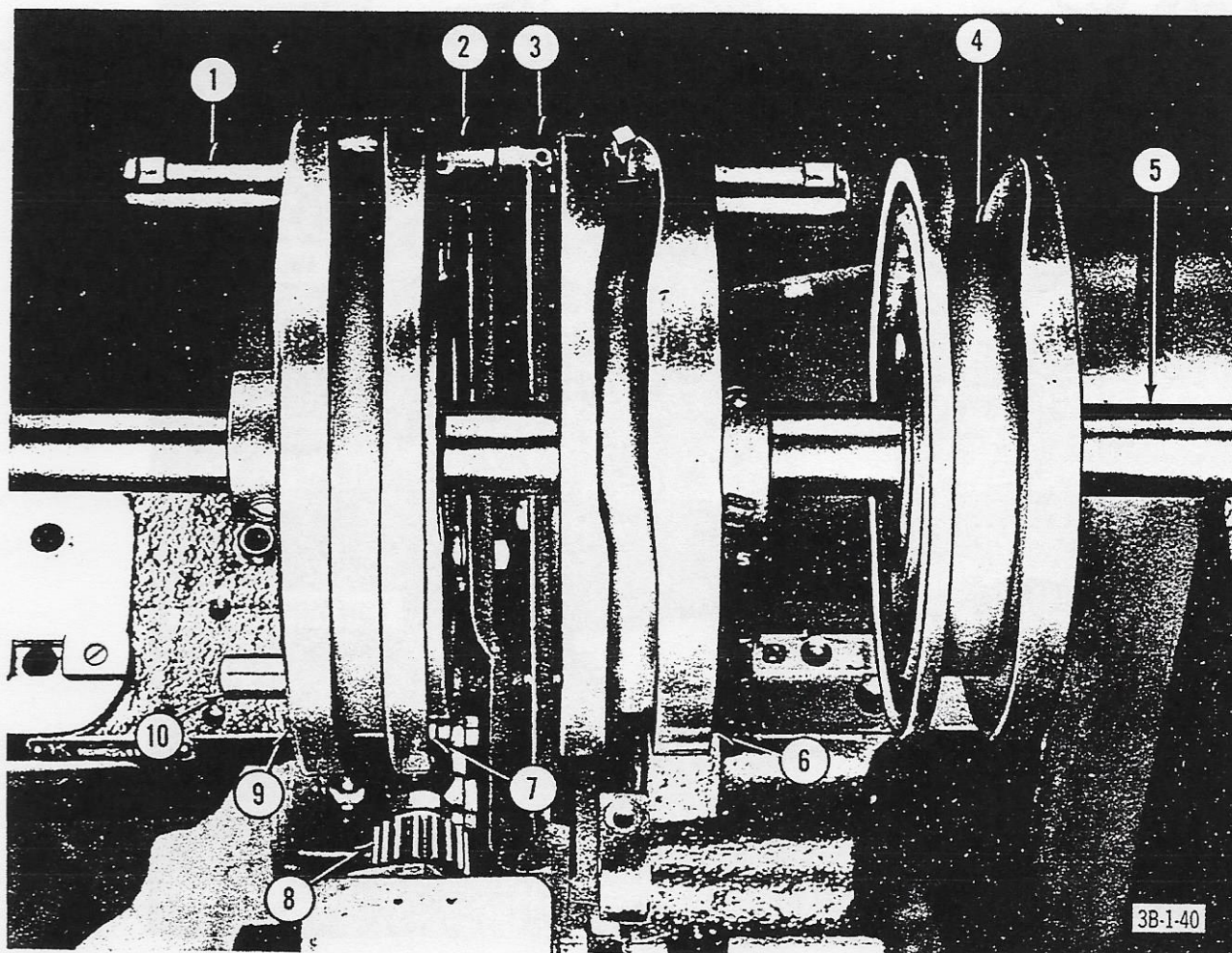
Figure 39. Awl cam lever, exploded view.

and washer (2) into hole in end of drive segment pinion.

- (60) Tap needle guide dowel pins (15, fig. 38) into openings in guide arm (16), place guide (14) on dowel pins, and install guide screw (17) through in guide arm and into hole in guide.
- (61) Tap clamp block locating pin (10) and clamp block screw locating pin (9) into drive segment (12).
- (62) Place clamp assembly (8) on locating pins, fit clamp screw (7) through openings in clamp assembly and drive segment, and install clamp screw nut (13) on clamp screw.
- (63) Place needle guide arm with guide on forward opening of drive segment.
- (64) Turn cams until needle cam lever (3) is at its lowest position (2, fig.

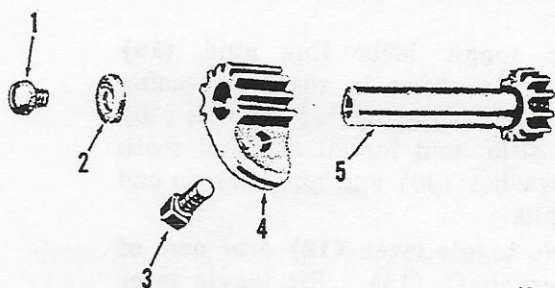
43). Place assembled needle segment (1) so that first tooth at top of needle segment will fit into slot between first and second teeth of needle cam lever.

- (65) Install needle segment stud (6, fig. 38) through needle segment and opening in shuttle head (8, fig. 43). Make certain small end of stud has half moon facing front of stitcher head frame.
- (66) Slide needle segment stud washer 18, fig. 38) over stud and install washer retaining screw (19) into stud tightly enough to take side play out of needle segment.
- (67) Aline setscrew seat on stud with needle segment stud setscrew (9, fig. 43) and tighten setscrew.
- (68) Turn cams to make certain needle segment is not too tight. If needle segment is binding, loosen retaining screw and setscrew slightly and tap retaining screw lightly. Retighten setscrew and retaining screw.
- (69) Place shuttle cam lever roll stud (4, fig. 44) in cam lever (1), fasten stud with external tooth lockwasher (3) and stud nut (2), and fit roll (5) on stud.
- (70) Fit pivot end of shuttle cam lever on cam lever shaft (1, fig. 40), and slide lever over engaging shuttle driver pinion (2, fig. 45). At same time, fit shuttle cam lever roll in proper race on left side of No. 2 cam.
- (71) Turn shuttle driver (3) until fork is at opening of shuttle case. Turn cams until needle segment (4) rides between prongs of shuttle driver.
- (72) Slide thread tension wheel inner washer (9, fig. 46) and wheel friction disk (10) on stud (8). Move disk against flange of stud.
- (73) Fit end of stud through lower opening of left side of stitcher head frame (fig. 47.) Screw stud nut (11, fig.



- | | | | |
|---|------------------|----|-----------------------|
| 1 | Cam lever shaft | 6 | No. 3 cam |
| 2 | Needle cam lever | 7 | Thread hook cam roll |
| 3 | Awl cam lever | 8 | Shuttle driver pinion |
| 4 | No. 4 cam | 9 | No. 2 cam |
| 5 | Camshaft | 10 | Shuttle head stud |

Figure 40. No. 2, No. 3, and No. 4 cams with needle and awl cam lever assemblies mounted on frame.



- | | | | |
|---|------------------------|---|---------------|
| 1 | Retaining washer screw | 4 | Drive segment |
| 2 | Retaining washer | 5 | Pinion |
| 3 | Binding screw | | |

Figure 41. Needle guide drive segment assembly, exploded view.

46) on end of stud extending through right side of frame.

(74) Slide thread tension wheel (7), wheel outer washer (6), and spring friction disk (5) on stud.

(75) Fit release yoke guide screws (12 and 15) into release yoke (14).

(76) Align bottom hole in release yoke with stud hole in arm of auxiliary takeup bracket (13, fig. 30).

(77) Insert release yoke stud (13, fig. 46) through opening in yoke and into thread stud hole in takeup bracket (5, fig. 47). Tighten stud.

(78) Slip release collar (4, fig. 46) and

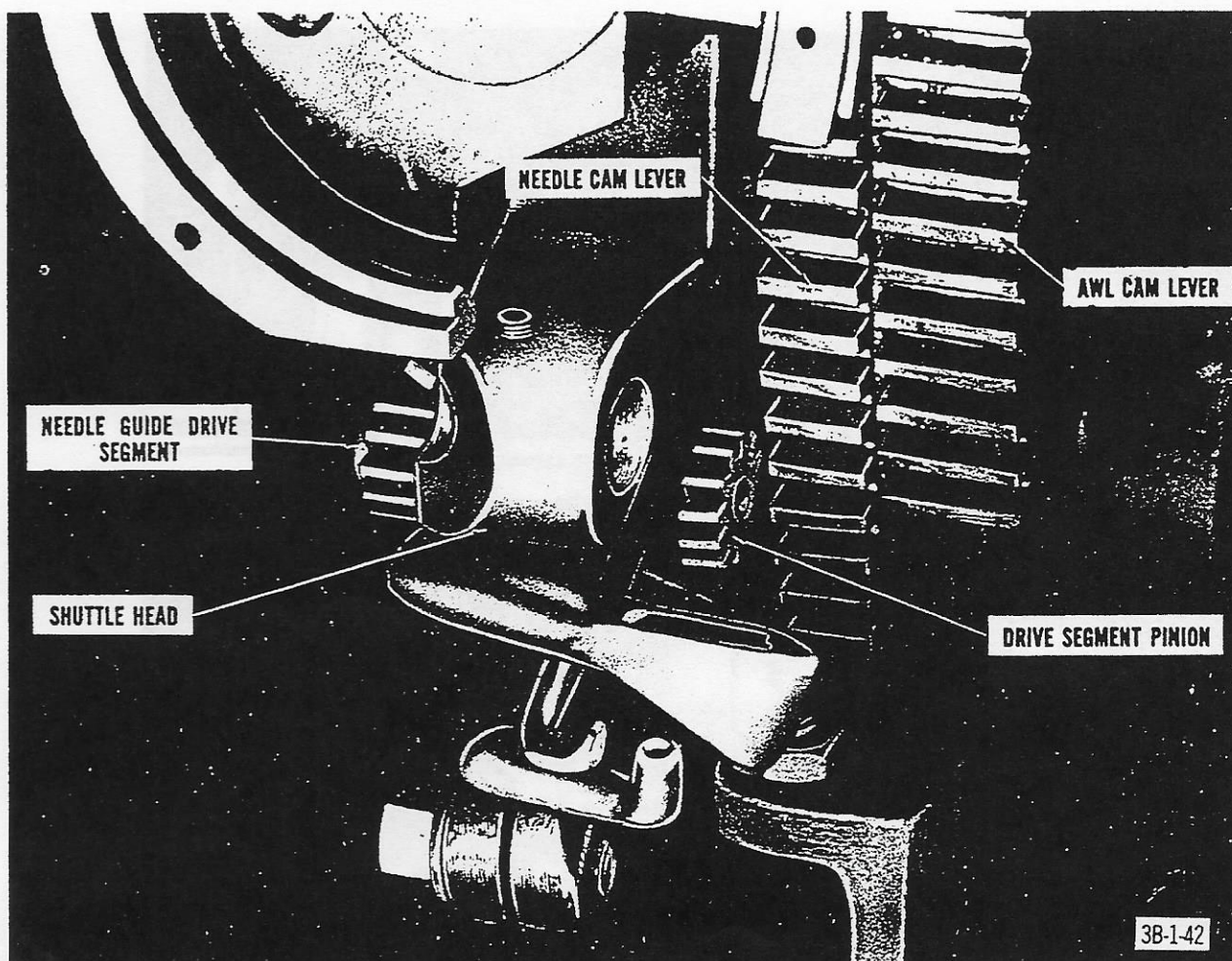


Figure 42. Needle guide drive segment with pinion installed.

spring (3) on stud, and slide spring into opening of collar.

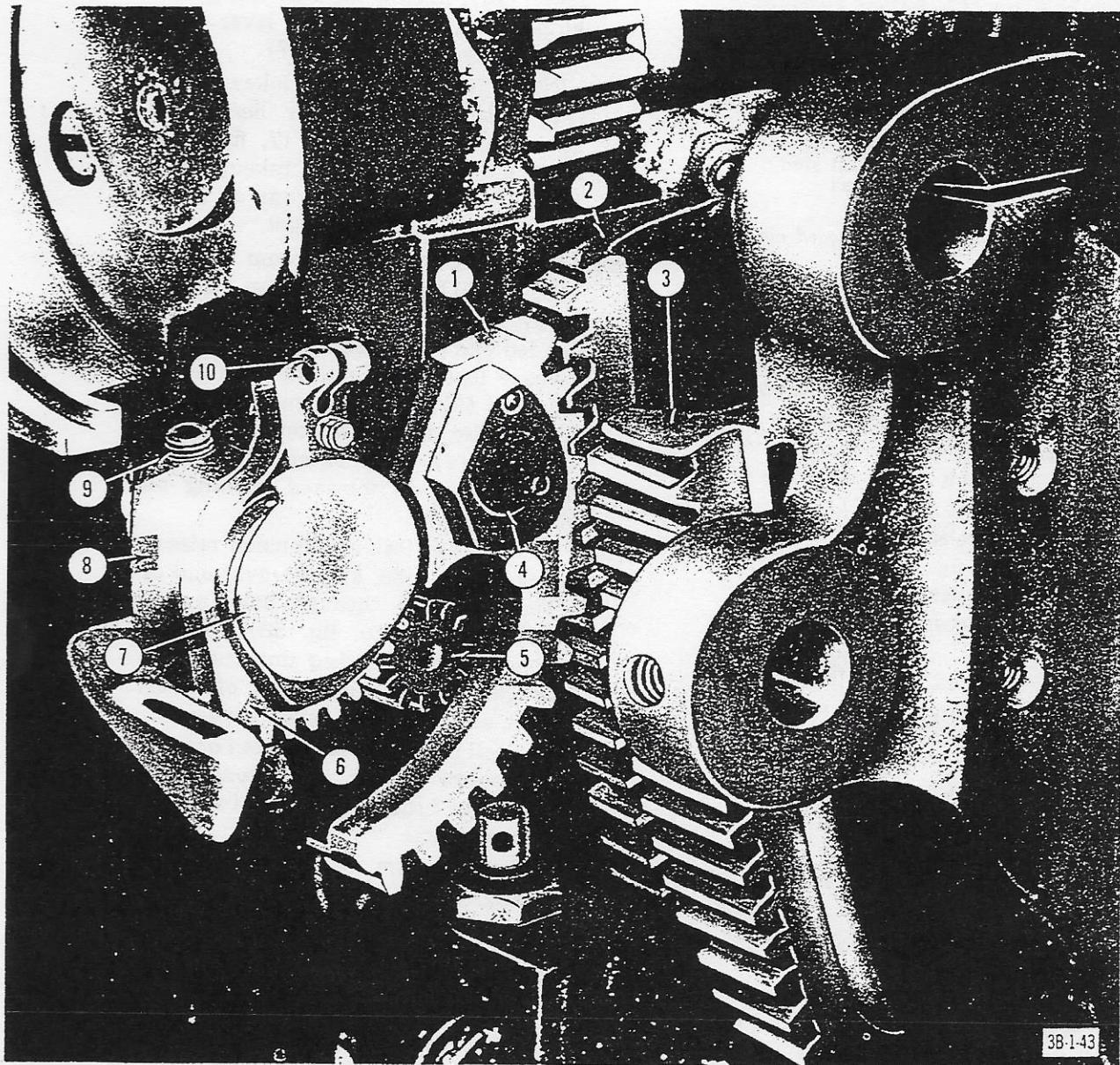
- (79) Screw spring adjusting disk (2) and disk lock disk (1) on stud. Make sure both disks are tightened enough so only one thread of stud shows.
- (80) Place thread lock roll stud (22, fig. 48) into auxiliary takeup bracket (2, fig. 47), screw stud nut (21, fig. 48) on stud extending from right side of frame, slide thread lock roll (24) on stud, place retaining washer (25) and screw (26) on stud, and tighten screw.
- (81) Fit end of thread lock and tension release lever (20) into opening in stitcher head frame (8, fig. 47). Turn lever until arm on lever rides on

right side of thread tension release yoke (4).

- (82) Fit special woodruff key (35, fig. 48) in key seat on extended end of release lever.
- (83) Slip toggle lever link stud (19) through opening in toggle releasing lever (28), slide toggle lever link (16) over stud, and install external tooth lockwasher (30) and nut (31) on end of stud.
- (84) Slide toggle lever (12) over arm of rocker shaft (15). Fit toggle lever stud (11) into openings of toggle lever and arm of rocker shaft.
- (85) Install external tooth lockwasher (13) and toggle lever stud nut (14) on stud.

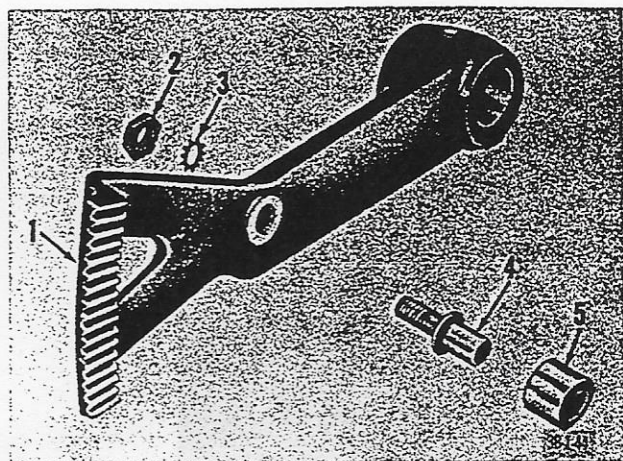
- (86) Slide rocker shaft swivel (10) into opening of toggle lever and through opening of toggle lever link, and install rocker shaft swivel washer (17) and nut (18) on swivel.
- (87) Fit round bottom woodruff key (34) into key seat on thread lock and tension release lever.

- (88) Take toggle releasing lever and rocker shaft assemblies and slip toggle releasing lever (9, fig. 49) over end of thread lock and tension release lever (10). Guide keyway in toggle releasing lever over woodruff key in thread lock and tension release lever and, at the same time, fit end of rocker shaft



- | | |
|-------------------------------------|--------------------------------|
| 1 Needle segment | 6 Needle guide arm |
| 2 Needle cam lever | 7 Needle segment stud |
| 3 Awl cam lever | 8 Shuttle head |
| 4 Needle clamp | 9 Needle segment stud setscrew |
| 5 Needle guide drive segment pinion | 10 Needle guide |

Figure 43. Timing of needle cam lever and needle segment.



- | | |
|-----------------------------|-------------|
| 1 Cam lever | 4 Roll stud |
| 2 Roll stud nut | 5 Roll |
| 3 External tooth lockwasher | |

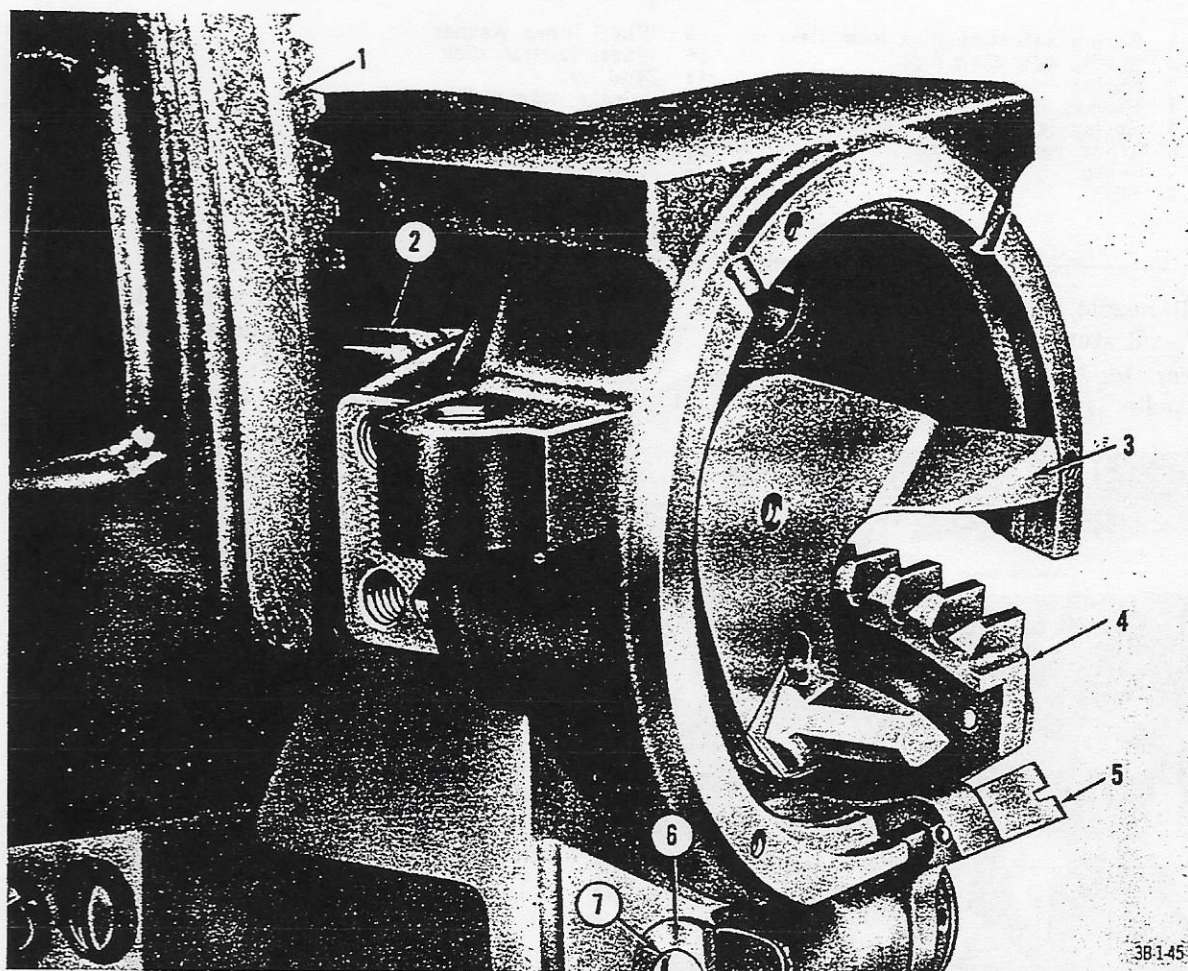
Figure 44. Shuttle driver cam lever, exploded view.

in rear opening in stitcher head frame until flush.

- (89) Slide thread lock lever (23, fig. 48) on takeup lever bushing in stitcher head frame (7, fig. 49), fitting front end of lock lever under thread lock roll (8) and back end into fork of thread lock rocker shaft (11).
- (90) Install toggle releasing lever retaining screw (29, fig. 48), fingertight, through toggle releasing lever against screw seat on thread lock and tension release lever.
- (91) Screw thread lock cam roll stud (3) into cam lever (4) and fit cam roll (2) on stud.
- (92) Slide thread lock cam lever pivot stud (6) through cam lever so extended end of stud is on same side of lever as cam roll.
- (93) Connect thread lock rocker shaft swivel connector (8) to cam lever with swivel connector stud (7) and cotter pin (1).
- (94) Screw rocker shaft swivel connector nut (9) halfway up threaded end of swivel connector and fit end of swivel connector through rear opening of rocker shaft swivel (10) on machine. Install swivel connector nut (27), fingertight, on end of swivel connector. Make certain thread lock cam

lever is in upright position and aligned to left (2, fig. 49).

- (95) This phase of the assembly of the thread lock assembly is illustrated in figure 50.
- (96) Fit takeup lever thread roll (15, fig. 51) on roll stud (14) and place roll guard (16) over roll on stud. Slide stud into opening in arm of takeup lever (13), making sure hole in guard aligns with dowel pin on lever arm. Fasten stud with nut (17).
- (97) Fit longest pivot end of takeup lever into bushing on stitcher head that holds thread lock lever (7, fig. 49). Slide lever to right until takeup lever thread roll (7, fig. 52) runs on track of auxiliary takeup bracket.
- (98) Slide takeup lever fulcrum bracket (21, fig. 51) into position on stitcher head frame (12, fig. 52). Fit extended end of thread lock and tension release lever into bottom opening of bracket (9), extended end of thread lock rocker shaft into top opening on bracket (4), and extended end of takeup lever in forward opening on bracket (10).
- (99) Slide thread lock and tension release lever washer (33, fig. 48) over end of lever extending through hole in fulcrum bracket (10, fig. 52). Install release lever adjusting nut and locknut (32, fig. 48) over end of lever. Leave one thread of lever exposed.
- (100) Install takeup lever fulcrum bracket short screw (20, fig. 51) through rear opening of bracket into hole in stitcher head frame.
- (101) Place fulcrum bracket long screw spacing collar (24) on long screw (25), and install screw through front opening of bracket into hole in stitcher head frame.
- (102) Install takeup lever friction spring (22) to fulcrum bracket with retaining screws (23).
- (103) Install needle guide cam lever roll stud (2, fig. 53) to cam lever (3) with external tooth lockwasher (4) and stud nut (5), and fit roll (1) on stud.



- | | |
|-------------------------|--|
| 1 Shuttle cam lever | 5 Needle guide |
| 2 Shuttle driver pinion | 6 Needle segment stud washer |
| 3 Shuttle driver | 7 Needle segment stud washer retaining screw |
| 4 Needle segment | |

Figure 45. Timing of shuttle driver and needle segment.

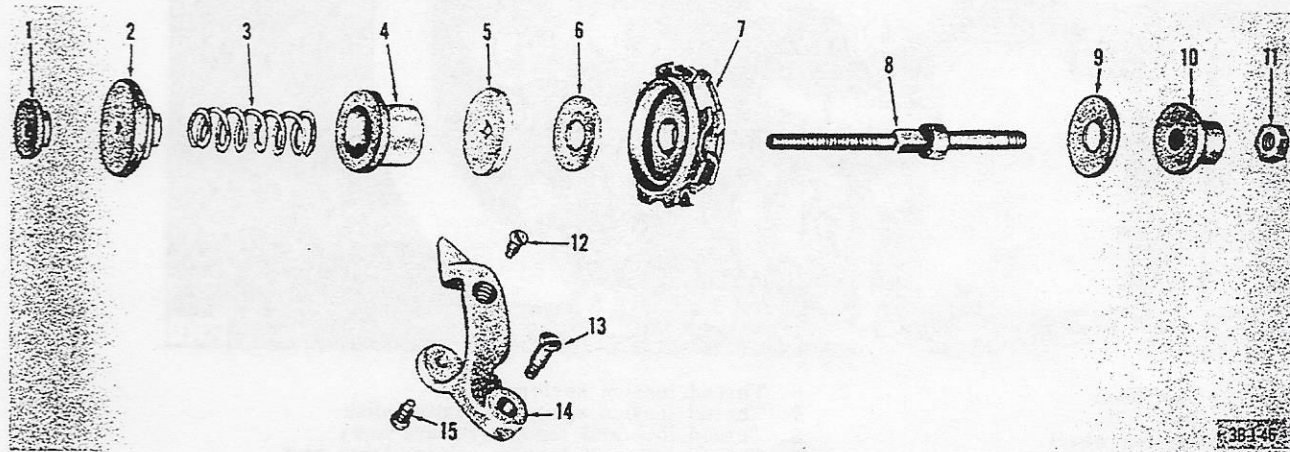


Figure 46. Thread tension assembly, exploded view.

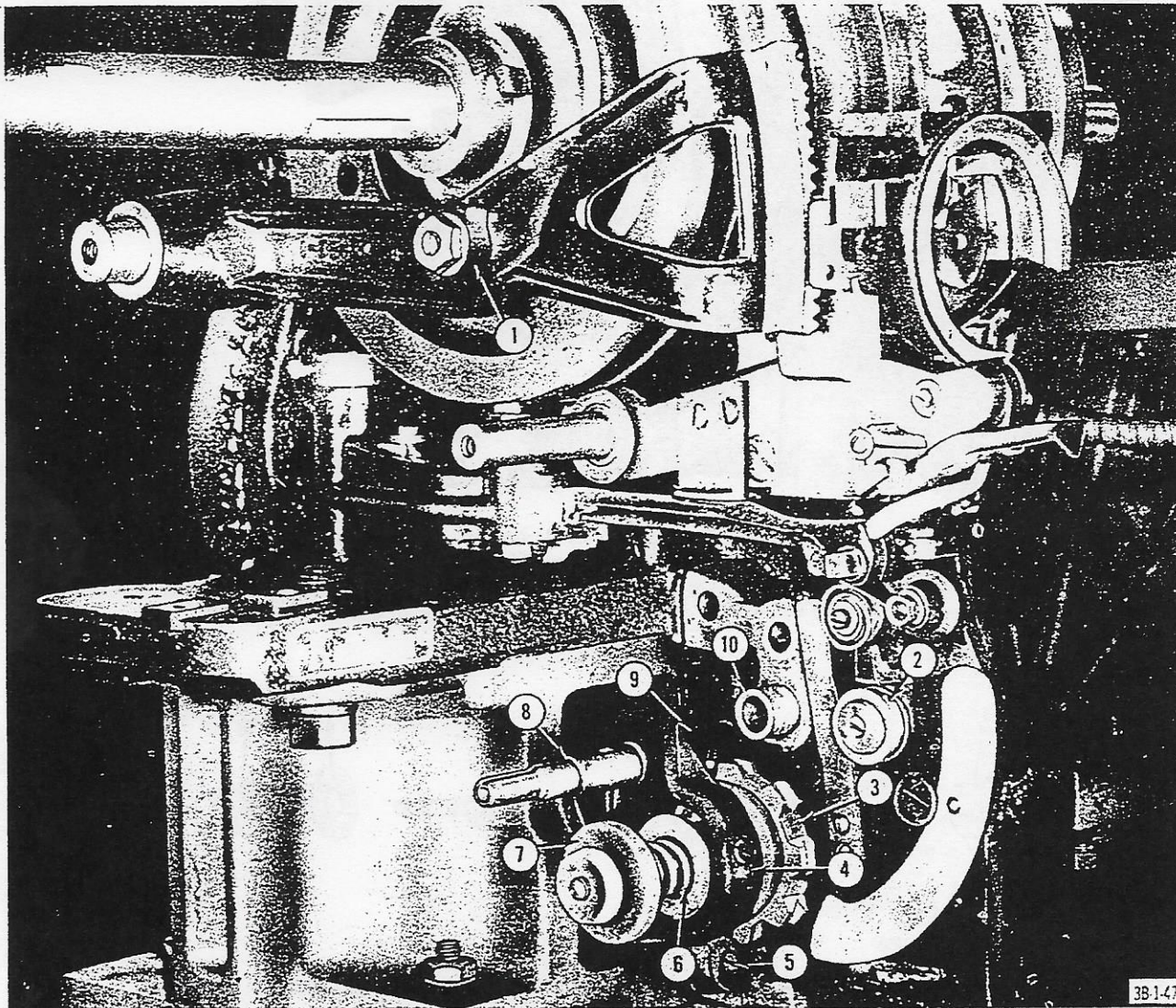
- | | |
|-----------------------------------|-----------------------------|
| 1 Spring adjusting disk lock disk | 9 Wheel inner washer |
| 2 Spring adjusting disk | 10 Wheel friction disk |
| 3 Spring | 11 Stud nut |
| 4 Release collar | 12 Release yoke guide screw |
| 5 Spring friction disk | 13 Release yoke stud |
| 6 Wheel outer washer | 14 Release yoke |
| 7 Wheel | 15 Release yoke guide screw |
| 8 Stud | |

Figure 46—Continued.

(104) Install needle guide cam lever on shuttle head stud (3, fig. 52). Slide cam lever to right, engaging lever with needle guide drive segment.

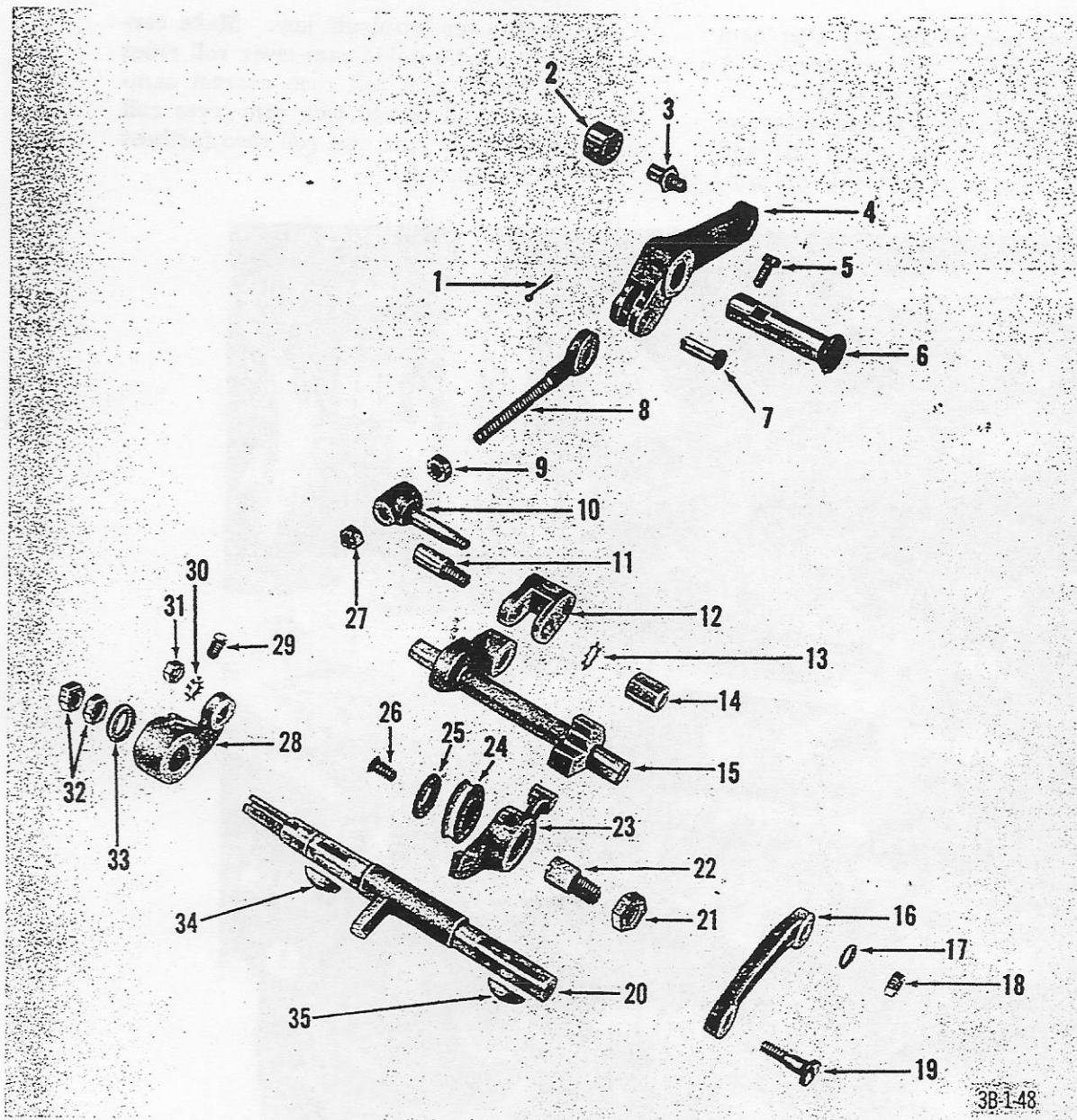
Make certain first tooth of segment fits into slot between first and second teeth of cam lever (fig. 54).

(105) Place needle guide cam lever re-



- | | |
|------------------------------------|---|
| 1 Shuttle cam lever | 6 Thread tension spring |
| 2 Thread lock roll | 7 Thread tension spring adjusting disk |
| 3 Thread tension wheel | 8 Thread lock and tension release lever |
| 4 Thread tension release yoke | 9 Thread lock and tension release lever arm |
| 5 Thread tension release yoke stud | 10 Takeup lever bushing |

Figure 47. Thread tension assembly installed.



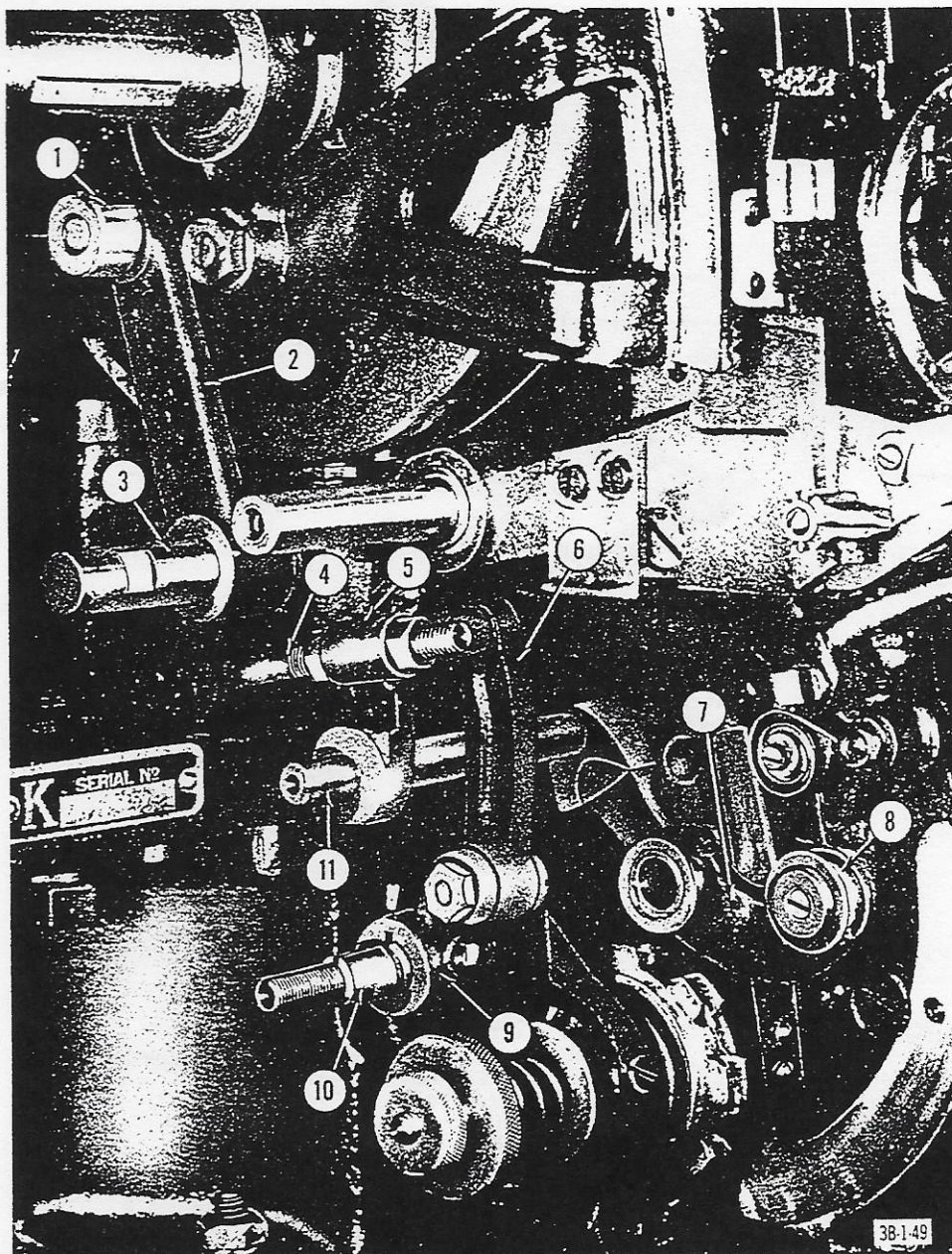
- | | |
|--|--|
| 1 Swivel connector cotter pin | 19 Toggle lever link stud |
| 2 Cam roll | 20 Thread lock and tension release lever |
| 3 Cam roll stud | 21 Roll stud nut |
| 4 Cam lever | 22 Roll stud |
| 5 Cam lever pivot stud setscrew | 23 Lever |
| 6 Cam lever pivot stud | 24 Roll |
| 7 Rocker shaft swivel connector stud | 25 Roll stud retaining washer |
| 8 Rocker shaft swivel connector | 26 Roll stud washer retaining screw |
| 9 Rocker shaft swivel connector nut | 27 Rocker shaft swivel connector nut |
| 10 Rocker shaft swivel | 28 Toggle releasing lever |
| 11 Toggle lever stud | 29 Toggle releasing lever retaining screw |
| 12 Toggle lever | 30 Toggle lever link stud nut external tooth lock- |
| 13 Toggle lever stud nut external tooth lockwasher | 31 Toggle lever link stud nut |
| 14 Toggle lever stud nut | 32 Thread lock and tension release lever nuts |
| 15 Rocker shaft | 33 Thread lock and tension release lever washer |
| 16 Toggle lever link | 34 Woodruff key, round bottom |
| 17 Rocker shaft swivel washer | 35 Woodruff key, special |
| 18 Rocker shaft swivel nut | |

Figure 48. Thread lock assembly, exploded view.

taining washer (6, fig. 53) over cam lever and install washer screw (7) into end of shuttle head stud.

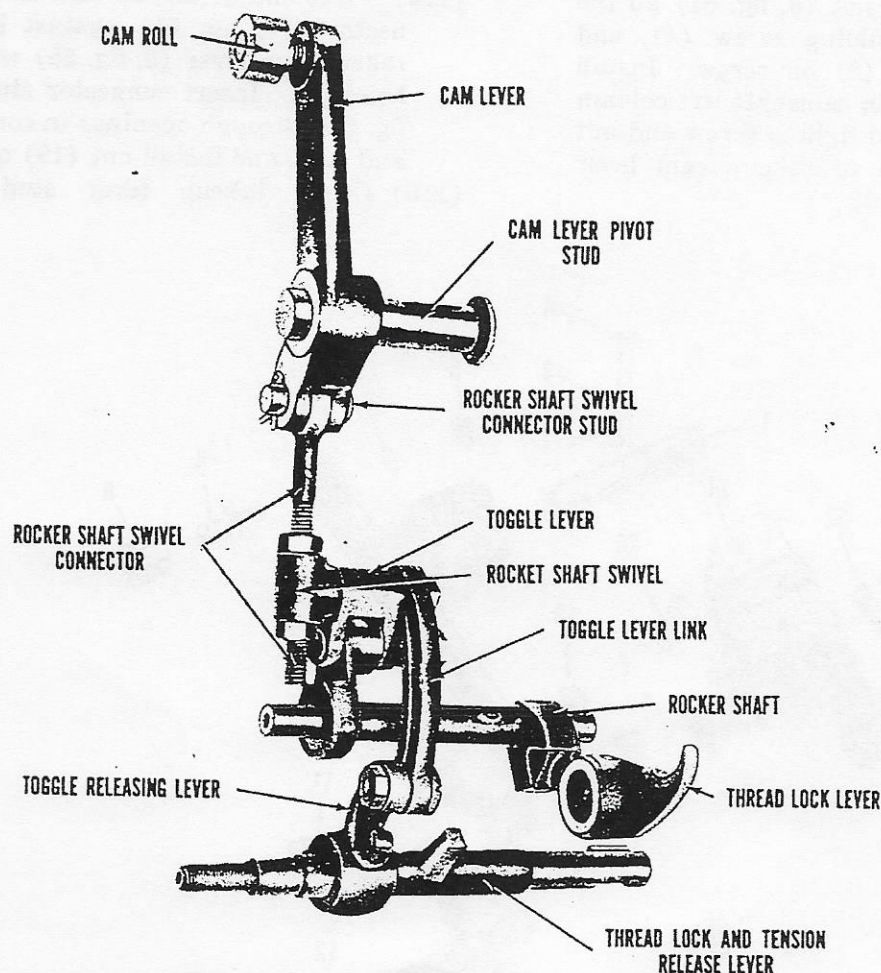
(106) Screw No. 1 cam headless setscrews (17, fig. 37) into No. 1 cam (5) and slide No. 1 cam on left side of cam-

shaft over woodruff key. Make certain needle guide cam lever roll rides in inside cam roll race nearest camshaft, and thread lock cam lever roll rides in outside cam roll race farthest from camshaft.



- | | |
|---------------------------------|--|
| 1 Cam roll | 7 Lever |
| 2 Cam lever | 8 Roll |
| 3 Cam lever pivot stud | 9 Toggle releasing lever |
| 4 Rocker shaft swivel connector | 10 Thread lock and tension release lever |
| 5 Rocker shaft swivel | 11 Rocker shaft |
| 6 Toggle lever link | |

Figure 49. Thread lock assembly installed.



38-1-50

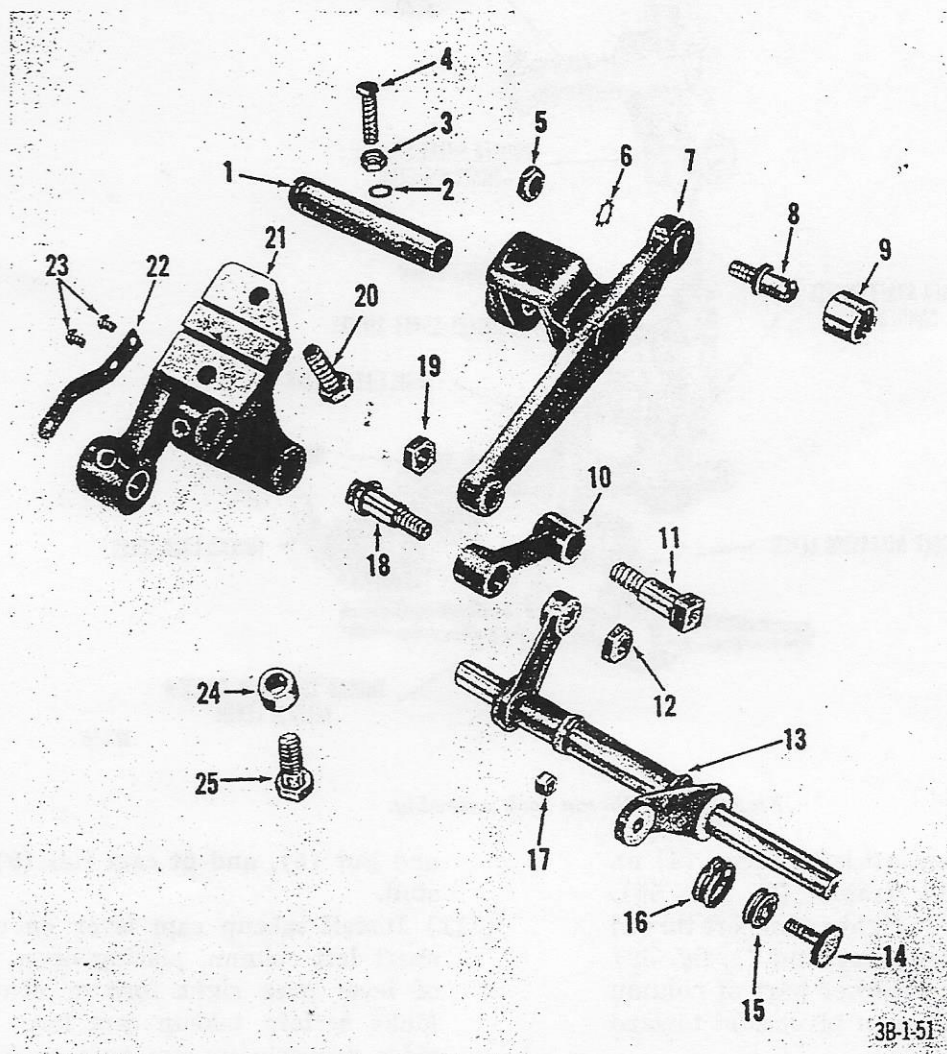
Figure 50. Thread lock assembly.

- (107) Install camshaft left column (4) on stitcher head frame (9, fig. 55). Slide column to right and insert thread lock cam lever pivot stud (1, fig. 52) through arm in lower part of column with flat surface of pivot stud toward front.
- (108) Aline setscrew seat on thread lock cam lever pivot stud with setscrew opening on camshaft left column, and install pivot stud setscrew (5, fig. 48) into hole in arm of column (7, fig. 55).
- (109) Install camshaft left column to stitcher head frame with screws (18, fig. 37) from underneath frame.
- (110) Place takeup cam lever roll stud (8, fig. 51) in stud hole in cam lever (7), fasten stud with lockwasher (6) and nut (5), and fit cam roll (9) on stud.
- (111) Install takeup cam lever on camshaft left column, placing open part of lever over right fork of column. Make certain takeup cam lever roll rides properly in cam race of No. 1 cam (fig. 55). Tighten No. 1 cam setscrews.
- (112) Insert takeup cam lever pivot stud (1, fig. 51) through opening in camshaft left column, and fit stud into stud holes in takeup cam lever with binding screw seat up. Push stud in until only shoulder is free (10, fig. 55). Make sure seat is matched with binding screw opening.
- (113) Screw takeup cam lever pivot stud

binding screw nut (3, fig. 51) all the way up on binding screw (4), and place washer (2) on screw. Install screw in hole in camshaft left column (3, fig. 55) and tighten screw and nut on screw seat of takeup cam lever pivot stud (10).

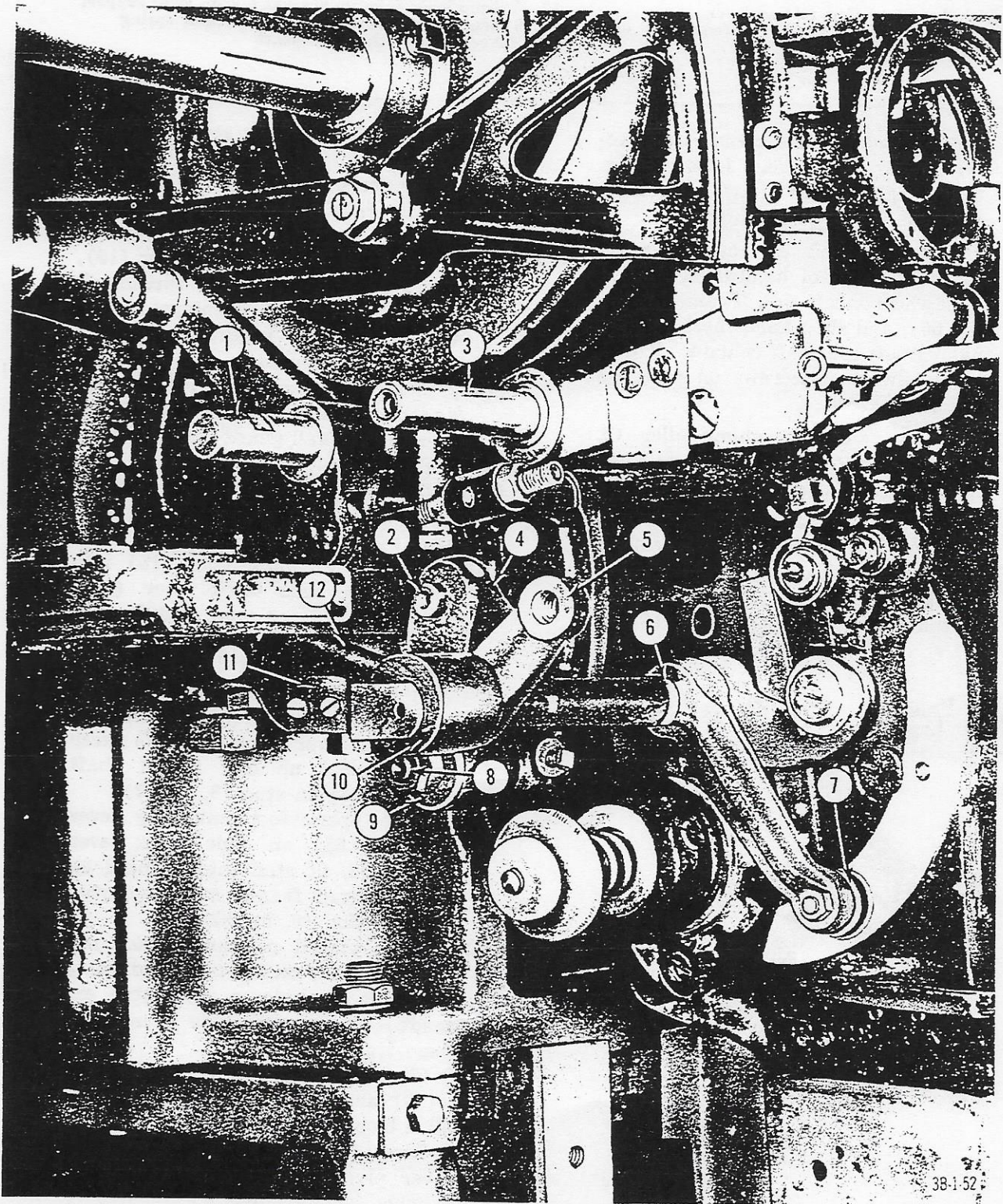
(114) Place end of takeup cam lever connector (10, fig. 51) against hole in takeup cam lever (8, fig. 55) with oil-holes up. Insert connector stud (11, fig. 51) through openings in connector and stud, and install nut (19) on stud.

(115) Insert takeup lever stud (18)



- | | |
|--|--|
| 1 Cam lever pivot stud | 14 Lever thread roll stud |
| 2 Cam lever pivot stud binding screw nut, washer | 15 Lever thread roll |
| 3 Cam lever pivot stud binding screw nut | 16 Lever thread roll guard |
| 4 Cam lever pivot stud binding screw | 17 Lever thread roll stud nut |
| 5 Cam roll stud nut | 18 Lever stud |
| 6 Cam roll stud lockwasher | 19 Cam lever connector stud nut |
| 7 Cam lever | 20 Lever fulcrum bracket short screw |
| 8 Cam roll stud | 21 Lever fulcrum bracket |
| 9 Cam roll | 22 Lever friction spring |
| 10 Cam lever connector | 23 Lever friction spring retaining screws |
| 11 Cam lever connector stud | 24 Lever fulcrum bracket long screw spacing collar |
| 12 Cam lever connector stud nut | 25 Lever fulcrum bracket long screw |
| 13 Lever | |

Figure 51. Thread takeup assembly, exploded view.



- | | |
|---|--|
| 1 Thread lock cam lever pivot stud | 5 shaft support |
| 2 Thread lock rocker shaft | 6 Takeup lever arm opening for cam lever connector |
| 3 Shuttle head stud | 7 Takeup lever thread roll |
| 4 Takeup lever fulcrum bracket thread lock rocker | |

Figure 52. Thread takeup assembly partially installed.

- 8 Thread lock and tension release lever
9 Takeup lever fulcrum bracket thread lock and tension release lever support

- 10 Takeup lever fulcrum bracket takeup lever support
11 Takeup lever fulcrum bracket friction spring
12 Takeup lever fulcrum bracket

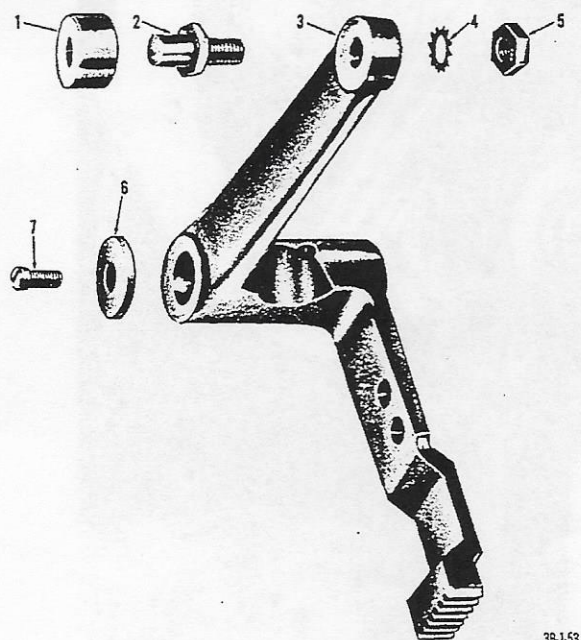
Figure 52—Continued.

through holes in lower end of connector and arm on takeup lever (5, fig. 52). Tighten stud in arm and screw stud nut (12, fig. 51) on stud.

(116) Install 2 handwheel setscrews (2, fig. 37) in hub of handwheel (1), fit handwheel on left side of camshaft (1, fig. 55), and slide handwheel to right against left camshaft column. Tighten handwheel setscrews on seats on camshaft.

(117) Screw camshaft column oiler (3, fig. 37) into column; oil fill lid must be up (fig. 55).

(118) Install presserfoot actuating slide front gib (1, fig. 56) on right side of stitcher head frame (1, fig. 57) with 2 retaining screws (2, fig. 56), and install rear gib (6) on frame (3, fig.



- | | |
|-----------------------------|--------------------|
| 1 Roll | 5 Roll stud nut |
| 2 Roll stud | 6 Retaining washer |
| 3 Cam lever | 7 Washer screw |
| 4 External tooth lockwasher | |

Figure 53. Needle guide cam lever, exploded view.

57) with 3 retaining screws (7, fig. 56).

(119) Slip presserfoot actuating slide (3) between front and rear gibs from top.

(120) Place thread measure thread roll (22, fig. 58) on thread roll lever (18), insert thread roll lever and thread roll stud (21) through openings in roll and lever, and handtighten screw stud nut (23) on stud.

(121) Place thread roll guard (19) over thread roll, align holes in guard and lever, and install guard screw (20).

(122) Tighten stud nut (23).

(123) Tighten thread roll lever setscrew (17) in thread roll lever one complete turn.

(124) Insert slide block stud (13) into opening in slide block lever (14), screw nut (15) on stud, and fit slide block (12) on other end of stud.

(125) Screw slide block lever setscrew (25) 1 complete turn in lever (14).

(126) Place slide block lever assembly on slide block lever pivot stud (27); keep flat surfaces up and install shaft washer (24) on stud (8, fig. 57).

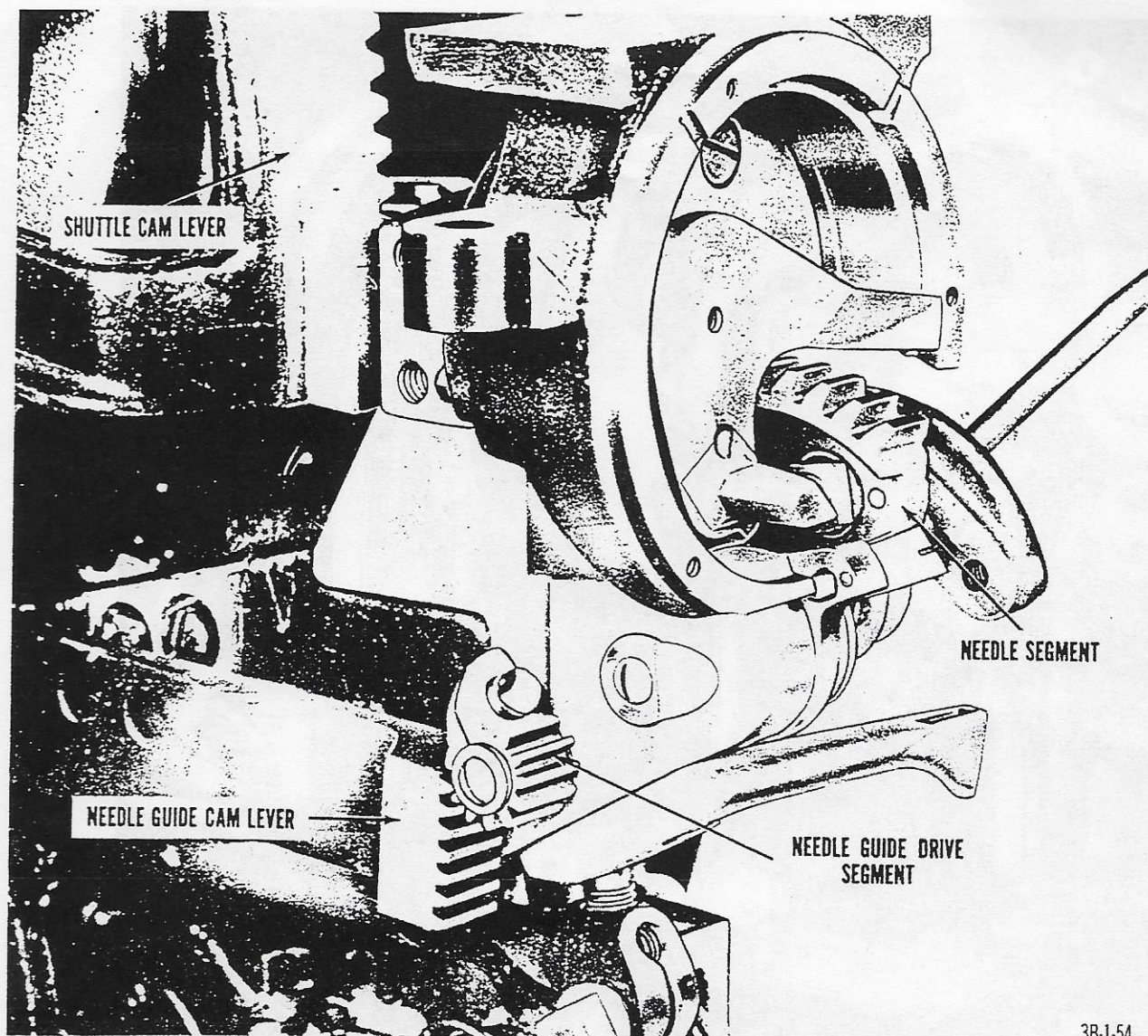
(127) Slide presserfoot unlocking lever (16, fig. 58) on slide block lever pivot stud, fit stud into opening on stitcher head frame, and slide stud into position (8, fig. 57).

(128) Place thread measure thread roll lever assembly on end of thread measure slide block lever pivot stud extended through left side of stitcher head frame (16, fig. 57).

(129) Tighten setscrews, referred to in (123) and (125) above, on seats of slide block lever pivot stud.

(130) Insert thread measure slide block lever pivot stud oiling cup (11) in stitcher head frame.

(131) Slip end of presserfoot actuating slide-to-lock release link (4, fig. 56) through opening in stitcher head frame (9, fig. 57) and install link up-



3B-1-54

Figure 54. Timing of needle guide cam lever and drive segment.

per stud (5, fig. 56) through opening of link into slide (3).

(132) Slide presserfoot-to-lock release lever shaft lever (9) on extended end of thread lock and tension release lever under shelf of frame, guiding keyway over key in release lever. Make certain end of lever with one hole points to rear of stitcher head frame (3, fig. 59).

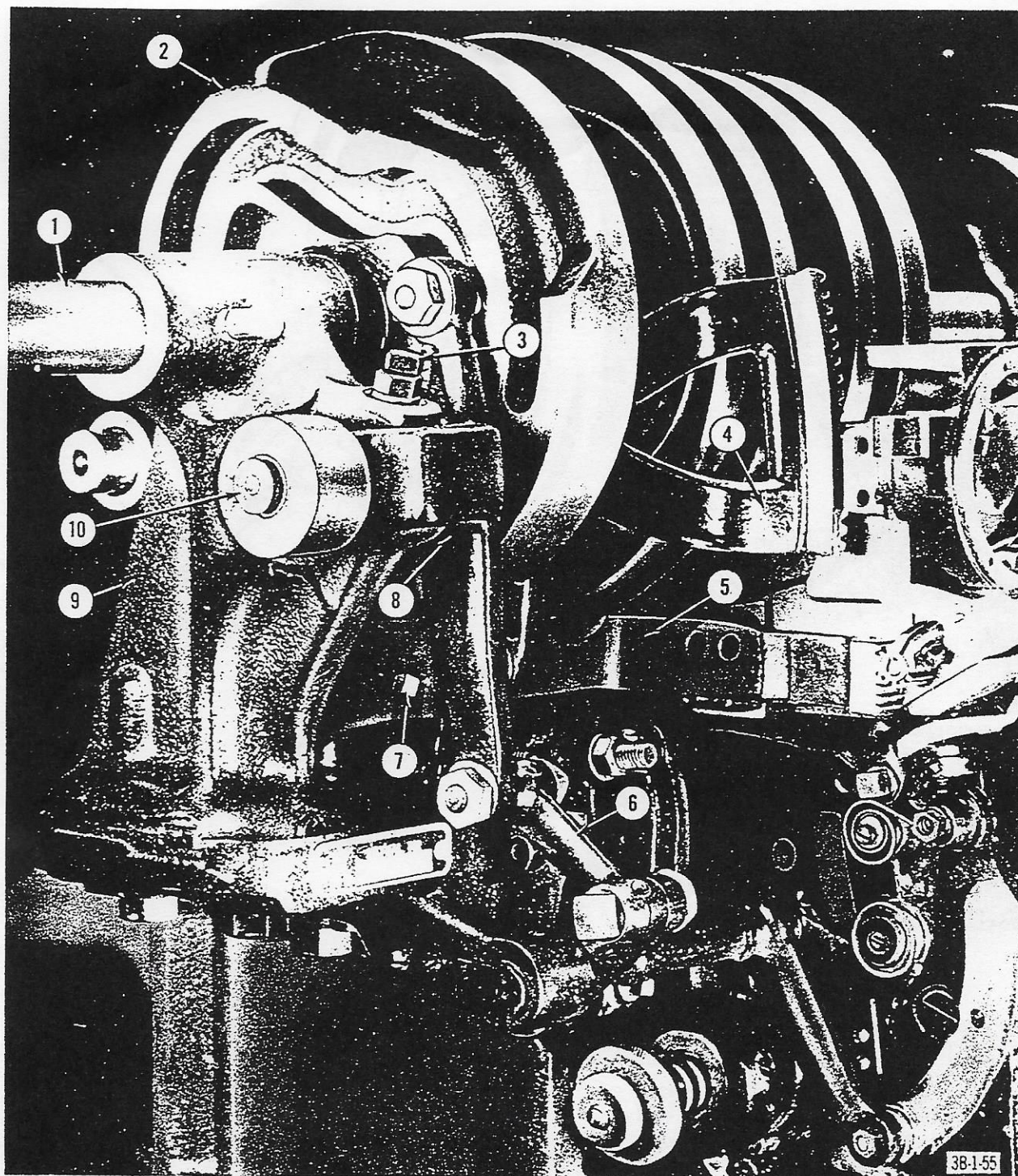
(133) Install presserfoot-to-lock release shaft lever setscrew (10, fig. 56) in shaft lever (4, fig. 59).

(134) Install slide-to-lock release link lower stud (8, fig. 56) through opening in link and into release lever shaft lever.

(135) Screw link lower stud nut (11) on link lower stud.

(136) Slide presserfoot cam lever eccentric release lever collar (35, fig. 60) and eccentric release lever (34) on shuttle head stud (5, fig. 57). Make certain longest end of lever points to rear of stitcher head frame.

(137) Place cam roll stud (2, fig. 60) into



- | | |
|---|---|
| 1 Camshaft | 6 Takeup cam lever connector |
| 2 No. 1 cam | 7 Thread lock cam lever pivot stud setscrew |
| 3 Takeup cam lever pivot stud binding screw | 8 Takeup cam lever |
| 4 Shuttle cam lever | 9 Left camshaft column |
| 5 Needle guide cam lever | 10 Takeup cam lever pivot stud |

Figure 55. No. 1 cam and left camshaft column installed.

center hole of cam lever (6), fasten stud with external tooth lockwasher (5) and stud nut (4), and fit cam roll (1) on stud.

(138) Tap cam lever bushing (9) into cam lever opening, fit cam lever eccentric assembly (38) into bushing, and install eccentric retaining washer (8) and screw (7) on end of eccentric assembly.

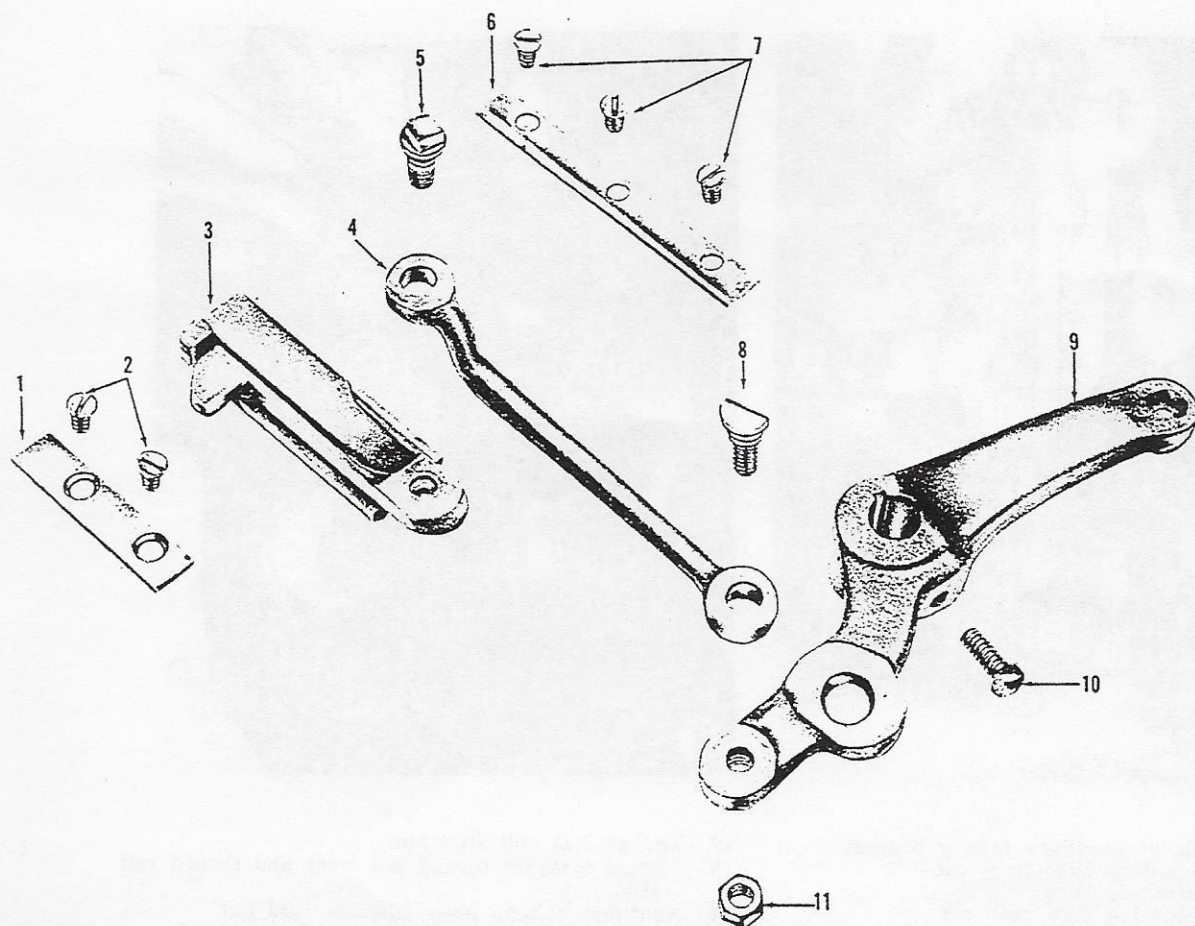
(139) Fit eccentric assembly spring screw (39) into hole in eccentric assembly.

(140) Install presserfoot cam lever on right side of frame by sliding cam roll

(2, fig. 61) into outside cam race of No. 3 cam. The eccentric roll, on edge of eccentric assembly, should be in its upmost position.

(141) Fit presserfoot cam lever pivot stud (3, fig. 60) through opening in cam lever and into support in frame (4, fig. 36) just below and to front of cam lever shaft.

(142) Tap presserfoot cam lever eccentric spring pin (41, fig. 60) into opening on stitcher head frame, below and to rear of cam lever shaft (4, fig. 61), and hook short end of spring (40, fig.



- 1 Front gib
- 2 Front gib retaining screws
- 3 Slide
- 4 Slide-to-lock release link
- 5 Slide-to-lock release link upper stud
- 6 Rear gib

- 7 Rear gib retaining screws
- 8 Slide-to-lock release link lower stud
- 9 Presserfoot-to-lock release lever shaft lever
- 10 Presserfoot-to-lock release shaft lever setscrew
- 11 Slide-to-lock release link lower stud nut

Figure 56. Presserfoot actuating slide assembly, exploded view.

3B-1-56

60) on pin, and long end of spring on spring screw (11, fig. 61).

(143) Insert presserfoot bar nut (36, fig. 60) in bar locking dog (37), insert locking dog inside bar adjusting sleeve (10), and fit sleeve into opening in adjusting sleeve block (11).

(144) Screw bar adjusting nut (14) on extended end of sleeve until only 1 thread is exposed on sleeve.

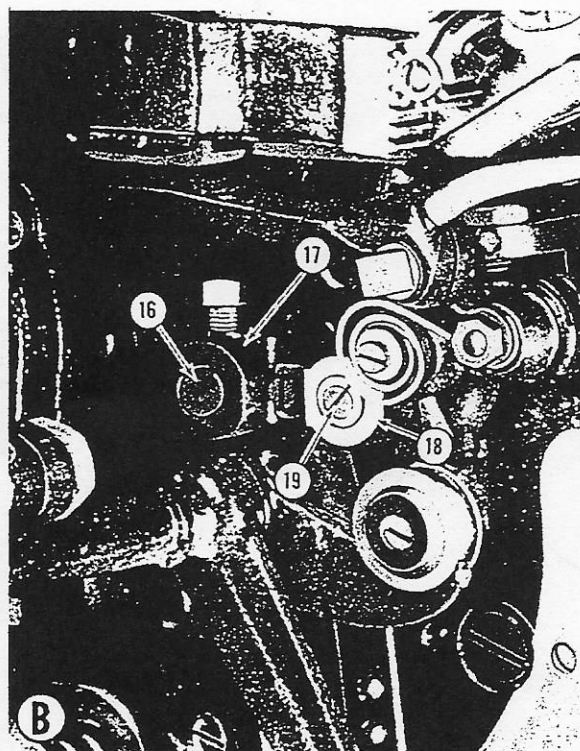
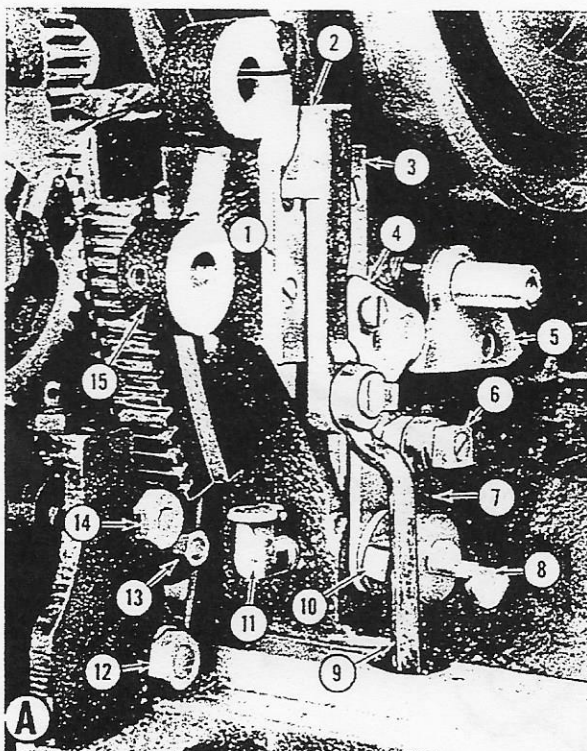
(145) Screw bar sleeve adjusting screw (16) through threaded hole in sleeve adjusting nut and into adjusting sleeve block (11), tighten screw 3 complete turns, and install sleeve ad-

justing screw lock screw (15) into adjusting nut, fingertight.

(146) Install bar adjusting sleeve assembly on extended end of shuttle head stud next to cam lever eccentric release lever (5, fig. 57). Slide sleeve block retaining washer (12, fig. 60) over end of shuttle head stud, and install screw (13) in end of stud (14, fig. 61).

(147) Install presserfoot raising lever (22, fig. 60) on lever (24) with 2 screws (21).

(148) Install presserfoot (31) on lever with 2 retaining screws (23).



A—Right side of auxiliary takeup bracket

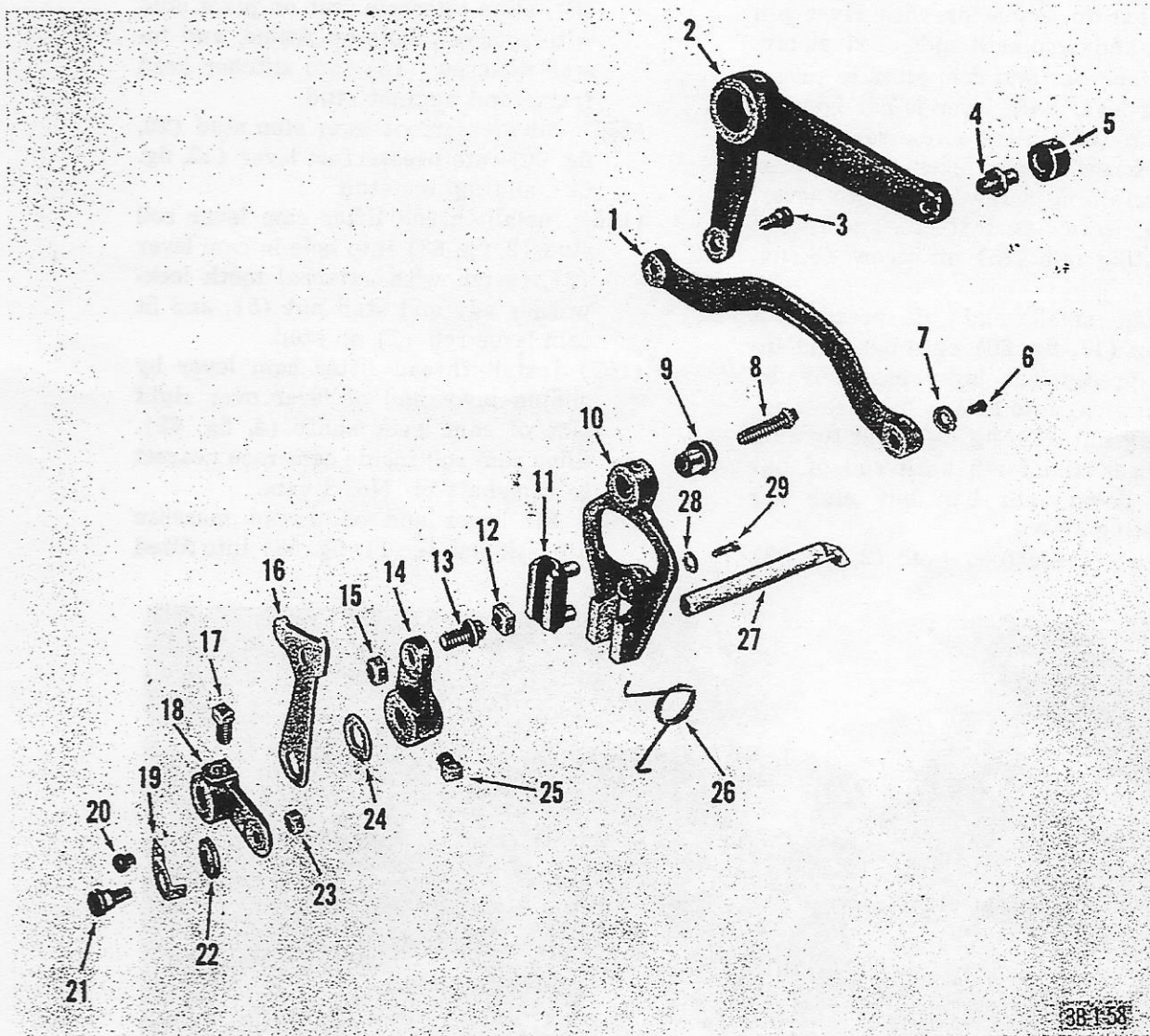
- 1 Presserfoot actuating slide front gib
- 2 Presserfoot actuating slide
- 3 Presserfoot actuating slide rear gib
- 4 Presserfoot unlocking lever
- 5 Presserfoot cam lever eccentric release lever
- 6 Thread measure slide block
- 7 Thread measure slide block lever
- 8 Thread measure slide block lever pivot stud
- 9 Presserfoot actuating slide-to-lock release link
- 10 Thread measure slide block lever setscrew
- 11 Thread measure slide block lever pivot stud oiling cup

- 12 Thread lock roll stud nut
- 13 Thread measure thread roll lever and thread roll stud nut
- 14 Auxiliary takeup lever fulcrum stud nut
- 15 Presserfoot lever pivot stud support bracket
- B—Left side of auxiliary takeup bracket
- 16 Thread measure slide block lever pivot stud
- 17 Thread measure thread roll lever
- 18 Thread measure thread roll guard
- 19 Thread measure thread roll and thread roll lever stud

Figure 57. Presserfoot actuating slide and thread measure assemblies, partially installed.

(149) Tighten channel knife adjusting screw (30) in threaded opening of presserfoot, place channel knife clamp

(28) on presserfoot, insert clamp screw (27) through hole in clamp and into presserfoot 1 complete turn, slide



- | | |
|---|--|
| 1 Cam lever connector | 16 Presserfoot unlocking lever |
| 2 Cam lever | 17 Thread roll lever setscrew |
| 3 Cam lever connector stud | 18 Thread roll lever |
| 4 Cam lever roll stud | 19 Thread roll guard |
| 5 Cam lever roll | 20 Thread roll guard screw |
| 6 Cam lever connector retaining collar washer screw | 21 Thread roll lever and thread roll stud |
| 7 Cam lever connector retaining collar washer | 22 Thread roll |
| 8 Adjusting bracket eccentric stud screw | 23 Thread roll lever and thread roll stud nut |
| 9 Adjusting bracket eccentric | 24 Shaft washer |
| 10 Adjusting bracket | 25 Slide block lever setscrew |
| 11 Adjusting slide | 26 Adjusting bracket spring |
| 12 Slide block lever slide block | 27 Slide block lever pivot stud |
| 13 Slide block lever slide block stud | 28 Adjusting slide retaining collar washer |
| 14 Slide block lever | 29 Adjusting slide retaining collar washer screw |
| 15 Slide block lever nut | |

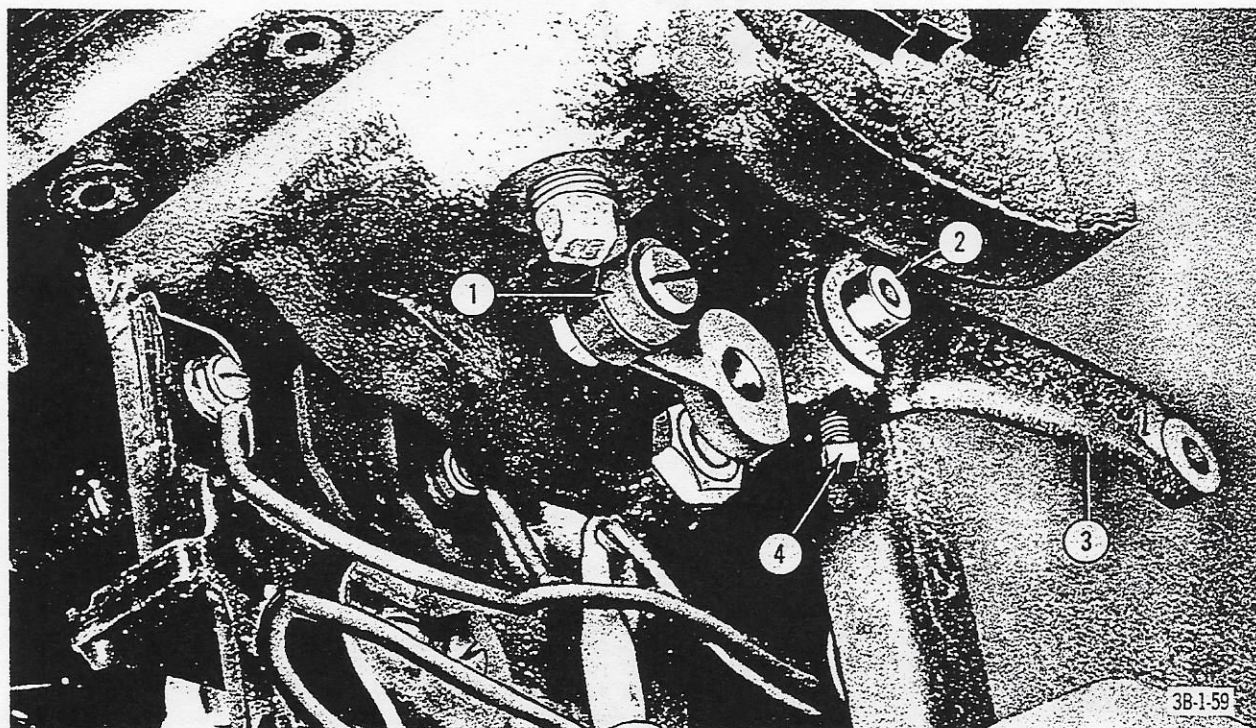
Figure 58. Thread measure assembly, exploded view.

channel knife (29) into slot between presserfoot and knife clamp, and tighten channel knife clamp screw.

- (150) Insert presserfoot bar (18) into opening of bar connector (19), connect bar to connector with rivet pin (33), and peen both ends of rivet pin.
- (151) Attach bar and connector to presserfoot lever with lever-to-bar connector pin (32), align screw seat of pin with screw hole in lever, install lever pin retaining screw (26) into lever, tighten screw against pin, and install adjusting nut (25) on screw (3, fig. 62).
- (152) Slide small end of presserfoot spring (17, fig. 60) onto bar, and install presserfoot lever assembly by pushing bar into hole in bar sleeve adjusting nut (16, fig. 61) and turning bar back and forth until end of bar slips down into bar nut and bar adjusting sleeve.
- (153) Move presserfoot lever (2, fig. 62)

to left until pivot end of lever rests across stud support (fig. 62).

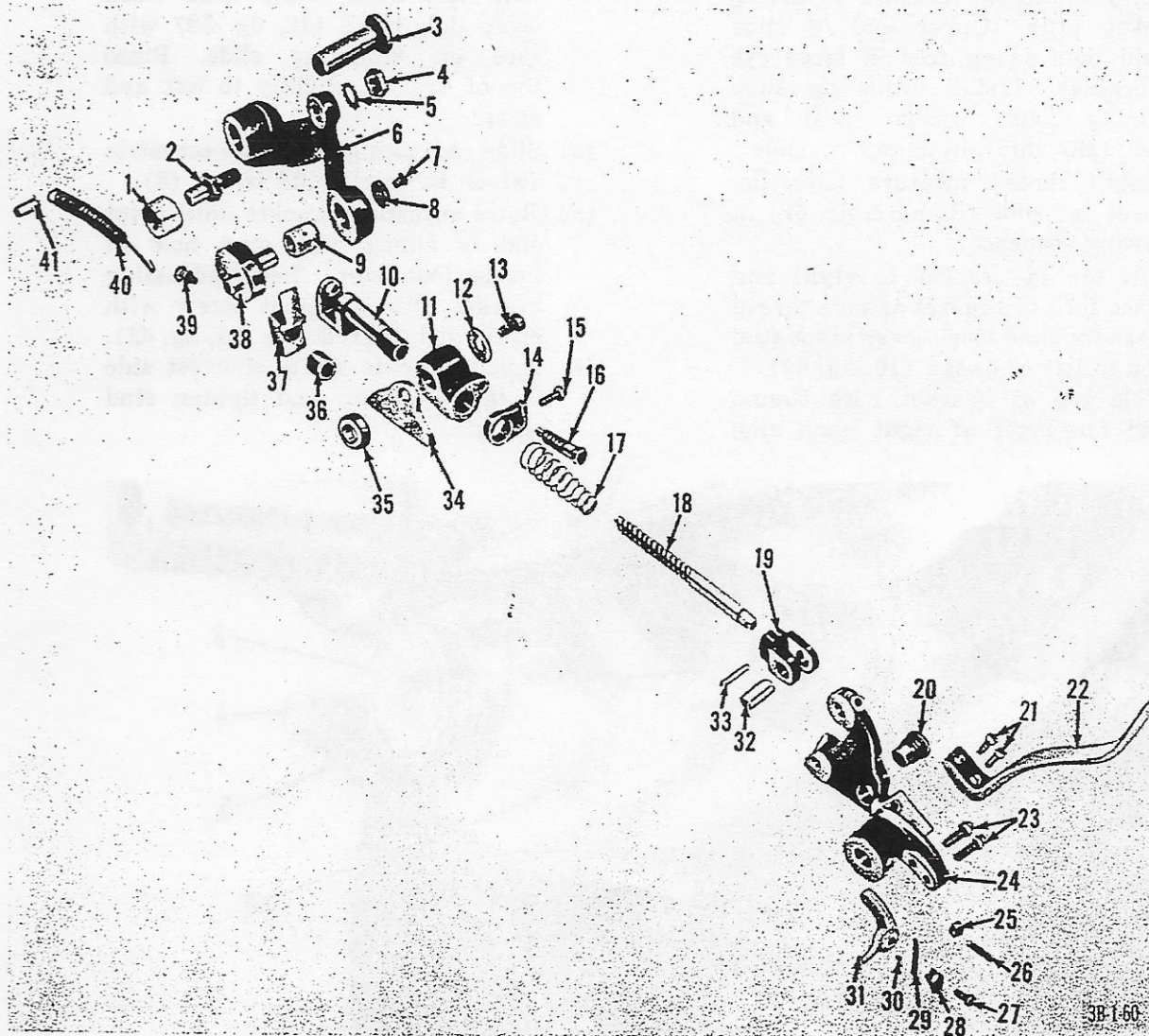
- (154) Install presserfoot lever pivot stud (14, fig. 63) through opening in lever and into stud hole on frame (13, fig. 62), align setscrew seat on pivot stud with setscrew hole on frame, and install setscrew (14) into stitcher head frame and against stud.
- (155) Fit presserfoot lever stop stud (20, fig. 60) into presserfoot lever (12, fig. 62), and tighten stud.
- (156) Install thread lifter cam lever roll stud (2, fig. 63) into hole in cam lever (3), fasten with external tooth lockwasher (4) and stud nut (5), and fit cam lever roll (1) on stud.
- (157) Install thread lifter cam lever by sliding pivot end of lever over right side of cam lever shaft (4, fig. 62). Slide cam roll inside cam race nearest to camshaft on No. 3 cam.
- (158) Fit lower end of thread measure adjusting slide (11, fig. 58) into fitted



- 1 Presserfoot actuating slide-to-lock release link
- 2 Thread lock and tension release lever
- 3 Presserfoot-to-lock release lever shaft lever

- 4 Presserfoot-to-lock release lever shaft lever setscrew

Figure 59. Presserfoot-to-lock release lever shaft lever installed.



- | | |
|--|---|
| 1 Cam roll | 22 Raising lever |
| 2 Cam roll stud | 23 Retaining screws |
| 3 Cam lever pivot stud | 24 Lever |
| 4 Cam roll stud nut | 25 Lever pin retaining screw adjusting nut |
| 5 External tooth lockwasher | 26 Lever pin retaining screw |
| 6 Cam lever | 27 Channel knife clamp screw |
| 7 Cam lever eccentric retaining washer screw | 28 Channel knife clamp |
| 8 Cam lever eccentric retaining washer | 29 Channel knife |
| 9 Cam lever bushing | 30 Channel knife adjusting screw |
| 10 Presserfoot bar adjusting sleeve | 31 Presserfoot |
| 11 Bar adjusting sleeve block | 32 Lever-to-bar connector pin |
| 12 Bar adjusting sleeve block retaining washer | 33 Bar connector rivet pin |
| 13 Bar adjusting sleeve block retaining washer screw | 34 Cam lever eccentric release lever |
| 14 Bar sleeve adjusting nut | 35 Cam lever eccentric release lever collar |
| 15 Bar sleeve adjusting screw lock screw | 36 Bar nut |
| 16 Bar sleeve adjusting screw | 37 Bar locking dog |
| 17 Spring | 38 Cam lever eccentric assembly |
| 18 Bar | 39 Cam lever eccentric spring screw |
| 19 Bar connector | 40 Cam lever eccentric spring |
| 20 Lever stop stud | 41 Cam lever eccentric spring pin |

Figure 60. Presserfoot raising lever assembly, exploded view.

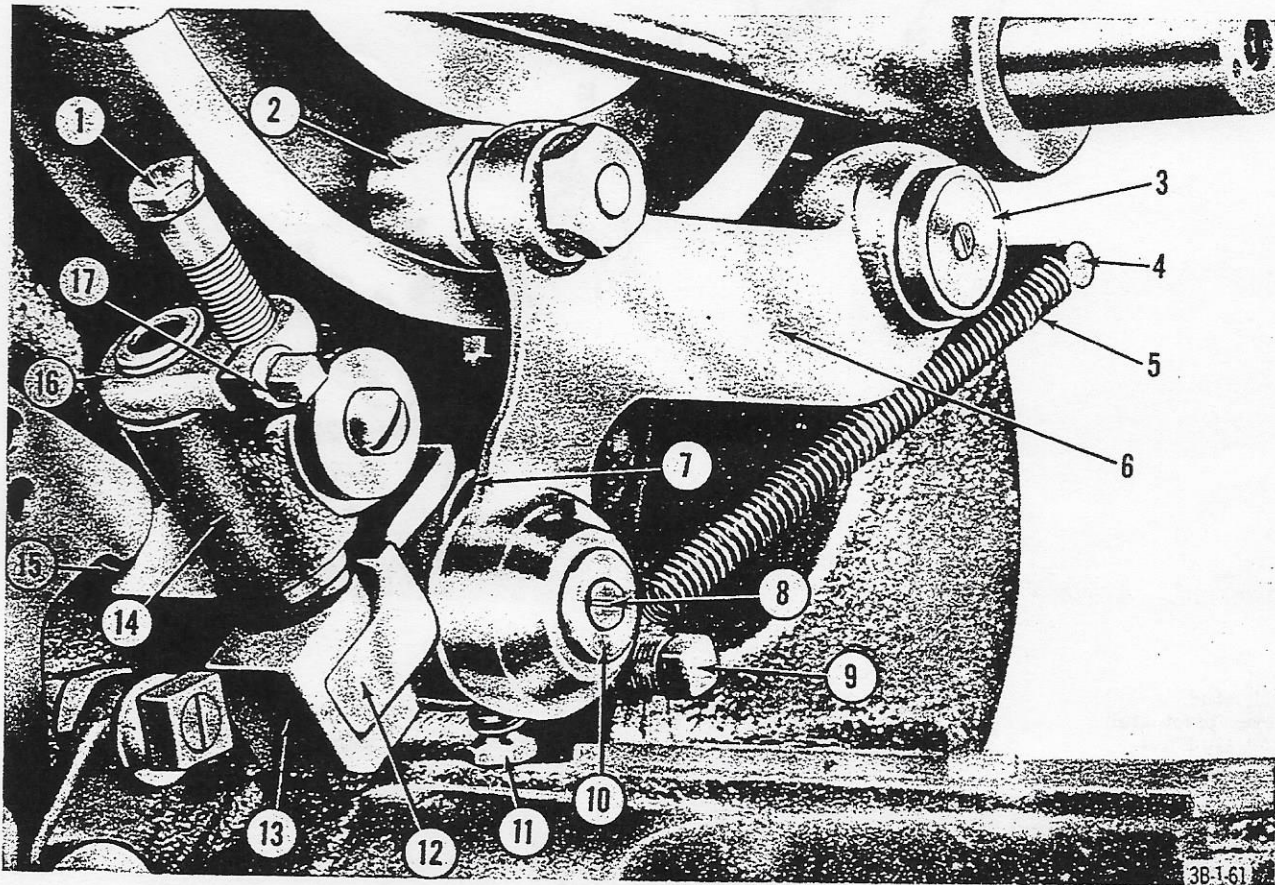
opening of thread measure adjusting bracket (10). Upper end of slide should then swing free in large eye of bracket. Install adjusting slide retaining collar washer (28) and screw (29) into lower end of slide.

(159) Install thread measure adjusting bracket and slide (8 and 9, fig. 62) in following sequence:

- (a) Tilt top of bracket to right and place fork of bracket astride thread measure slide block lever pivot stud and to left of flange (10, fig. 62).
- (b) Hold top of bracket with thumb and forefinger of right hand and,

with left hand, aline slide block lever slide block (12, fig. 58) with race on adjusting slide. Press top of bracket slightly to left and down.

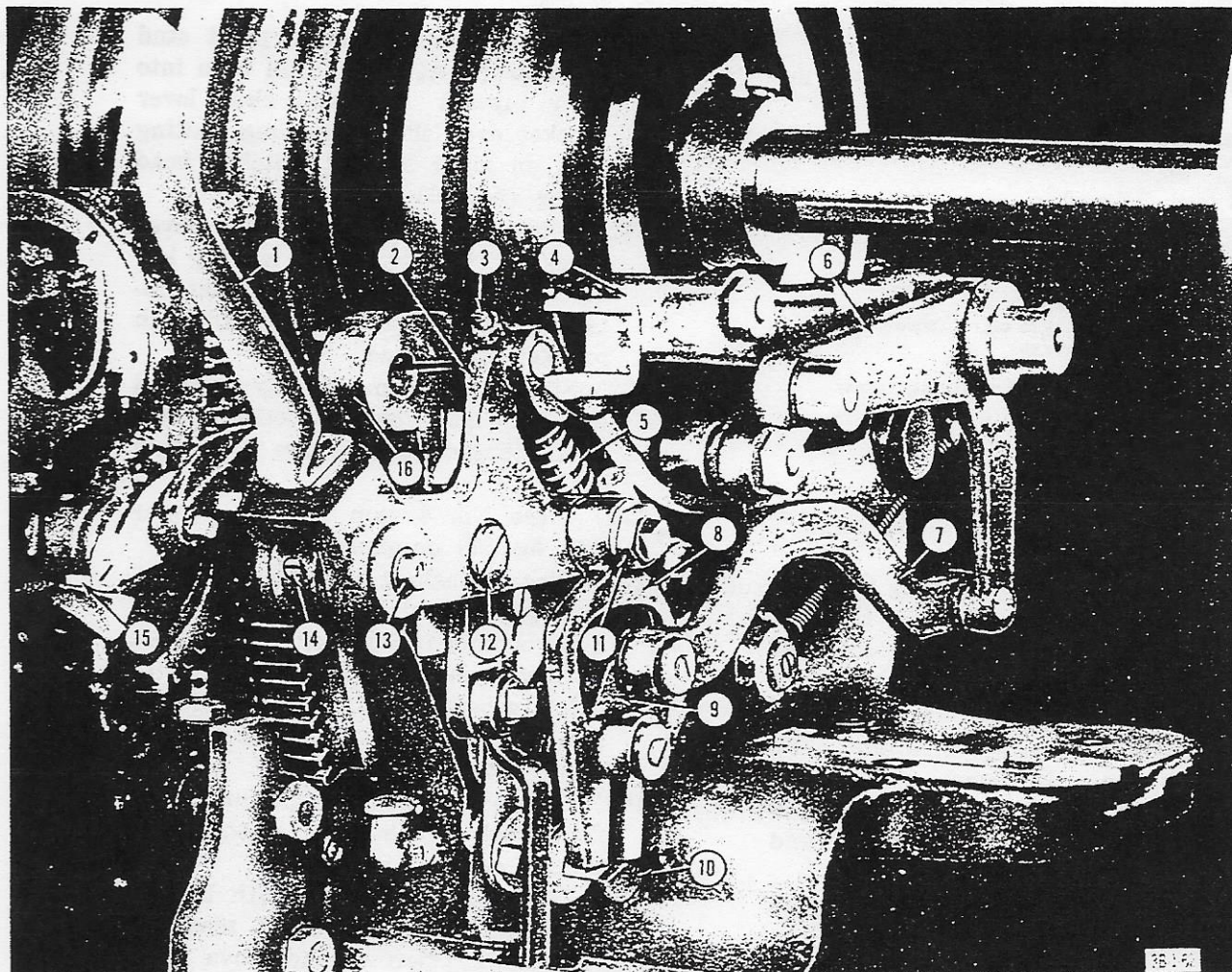
- (c) Slide adjusting bracket eccentric (9) on eccentric stud screw (8).
- (d) Raise adjusting bracket until pivot end is alined with stud hole in presserfoot lever. Insert adjusting bracket eccentric stud screw with eccentric into stud hole (11, fig. 62).
- (e) Hold eccentric so its shortest side is toward front, and tighten stud screw.



- | | |
|--|--|
| 1 Bar sleeve adjusting screw | 10 Cam lever eccentric retaining washer |
| 2 Cam roll | 11 Cam lever eccentric spring screw |
| 3 Cam lever pivot stud | 12 Bar locking dog |
| 4 Cam lever eccentric spring pin | 13 Bar adjusting sleeve |
| 5 Cam lever eccentric spring | 14 Bar adjusting sleeve block |
| 6 Cam lever | 15 Cam lever eccentric release lever |
| 7 Cam lever eccentric assembly | 16 Bar sleeve adjusting nut |
| 8 Cam lever eccentric retaining washer screw | 17 Bar sleeve adjusting screw lock screw |
| 9 Looper cam lever forward motion pivot stud set-screw | |

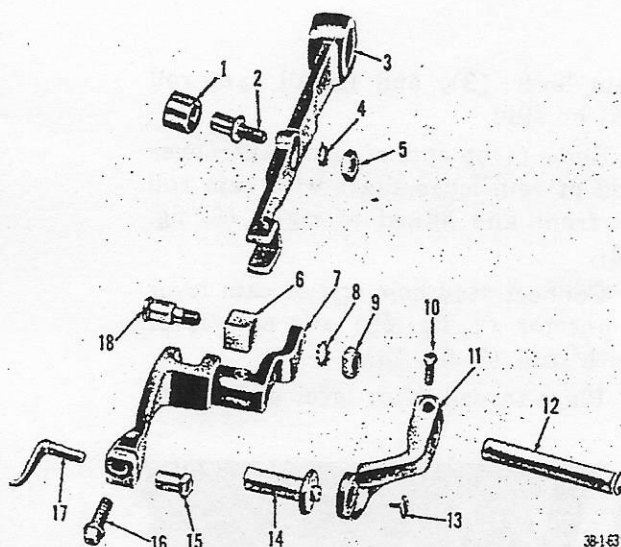
Figure 61. Presserfoot cam lever and bar adjusting sleeve block assembly installed.

- (f) Slide bearing surface opening in end of thread measure cam lever connector (1, fig. 58) over upper free end of adjusting slide, being sure to keep oilhole of connector in upright position.
- (g) Install cam lever connector to adjusting slide with retaining collar washer (7) and screw (6).
- (160) Screw cam lever roll stud (4) into cam lever (2), and install cam roll (5) on stud.
- (161) Slide pivot end of cam lever over end of cam lever shaft with cam roll to front and alined to right (6, fig. 62).
- (162) Connect stud hole end of cam lever connector (7, fig. 62) and cam lever with stud (3, fig. 58).
- (163) Place thread lifter lever slide block



- | | |
|---|--|
| 1 Presserfoot raising lever | 10 Thread measure slide block lever pivot stud |
| 2 Presserfoot lever | 11 Thread measure adjusting bracket eccentric |
| 3 Presserfoot lever retaining pin screw | 12 Presserfoot lever stop stud |
| 4 Thread lifter cam lever | 13 Presserfoot lever pivot stud |
| 5 Presserfoot spring | 14 Presserfoot lever pivot stud setscrew |
| 6 Thread measure cam lever | 15 Presserfoot |
| 7 Thread measure cam lever connector | 16 Thread lifter lever bracket with stud support, in |
| 8 Thread measure adjusting bracket | stitcher frame |
| 9 Thread measure adjusting slide | |

Figure 62. Presserfoot raising lever assembly; thread measure assembly installed with thread lifter cam lever.



- 1 Cam lever roll
- 2 Cam lever roll stud
- 3 Cam lever
- 4 External tooth lockwasher
- 5 Cam lever roll stud nut
- 6 Lever slide block
- 7 Lever
- 8 External tooth lockwasher
- 9 Lever slide block stud nut
- 10 Lever stud support bracket clamp screw
- 11 Lever stud support bracket
- 12 Lever pivot stud
- 13 Presserfoot lever pivot stud retaining screw
- 14 Presserfoot lever pivot stud
- 15 Eccentric stud
- 16 Binding screw
- 17 Thread lifter
- 18 Slide block stud

Figure 63. Thread lifter assembly, exploded view.

(6, fig. 63) against opening in lever (7), and install stud (18) through block into lever. Fasten stud with external tooth lockwasher (8) and nut (9).

(164) Fit thread lifter eccentric stud (15) into opening in lever, and install thread lifter (17) into stud. Install binding screw (16) into lever, and tighten screw to hold stud.

(165) Place pivot section of thread lifter lever astride thread lifter lever bracket (16, fig. 62) on stitcher head frame. Slide lever slide block in slide block race at end of cam lever.

(166) Aline pivot point of thread lifter lever with stud hole in thread lifter lever bracket on stitcher head frame, and insert lever pivot stud (12, fig. 63) through openings in lever stud

support bracket (11) and thread lifter lever, and into stud hole on frame.

(167) Slide lower end of thread lifter lever stud support bracket over end of presserfoot lever pivot stud, and install retaining screw (13) to hold bracket to stud.

(168) Install thread lifter lever pivot stud support bracket clamp screw (10) into hole in support bracket.

(169) Install thread lifter lever pivot stud binding screw (2, fig. 64) into thread lifter lever bracket in stitcher head frame.

(170) Install feed cam lever pivot stud setscrew (5, fig. 65) 1 full turn into lever bracket (4), and slide lever bracket over short and long seating keys on right side of stitcher head frame (fig. 66).

(171) Aline holes in feed cam lever bracket with hole in long seating key and frame, and install bracket retaining screw (3, fig. 65) through bracket into frame.

(172) Slide No. 4 cam, already installed on camshaft, over woodruff key, fitting thread measure cam roll in cam race.

(173) Place No. 4 cam spacing washer (20, fig. 37) on camshaft.

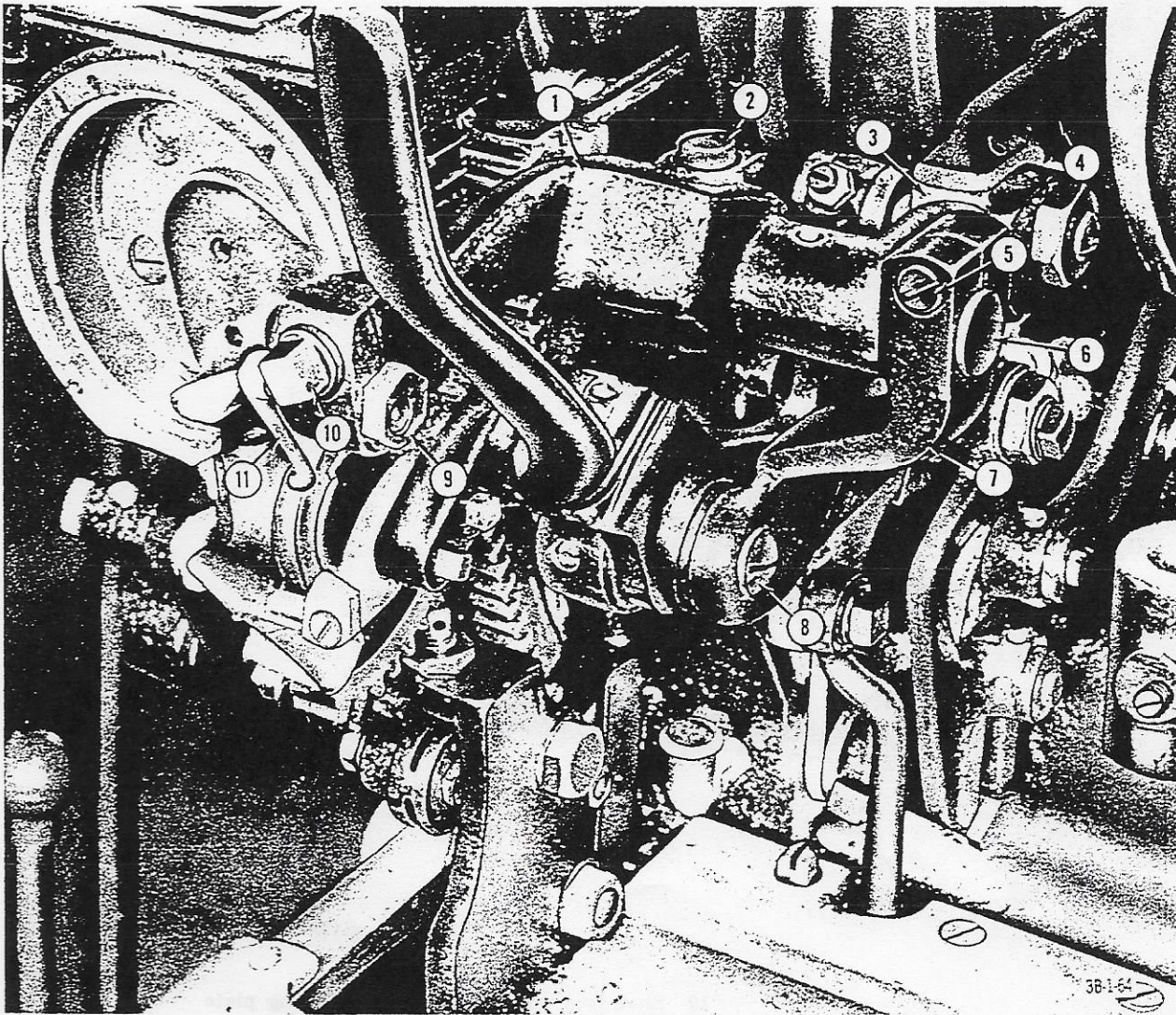
(174) Place camshaft right column (9) on right end of camshaft (fig. 66). Slide column to left until screw holes in lower end of column aline with holes in base, and install screws (11, fig. 37) from underneath stitcher frame into column (fig. 66).

(175) Slide No. 4 cam to right until it is flush with cam spacing washer, and tighten setscrew.

(176) If shaft is not flush with hub of handwheel on left side of machine, loose cam setscrews and move shaft until properly alined.

(177) Install camshaft right column oiler (10, fig. 37) with oil fill in upright position (fig. 66).

(178) Place feed slide retaining plate (9, fig. 67) on frame with half moon on plate facing to rear (fig. 66), and



- | | |
|--|--|
| 1 Lever | 7 Lever stud support bracket |
| 2 Lever pivot stud binding screw | 8 Presserfoot lever pivot stud retaining screw |
| 3 Lever slide block | 9 Eccentric stud |
| 4 Cam lever | 10 Binding screw |
| 5 Lever stud support bracket clamp screw | 11 Thread lifter |
| 6 Lever pivot stud | |

Figure 64. Thread lifter assembly completely installed.

install squarehead screw (7, fig. 67), and two fillister head screws (8).

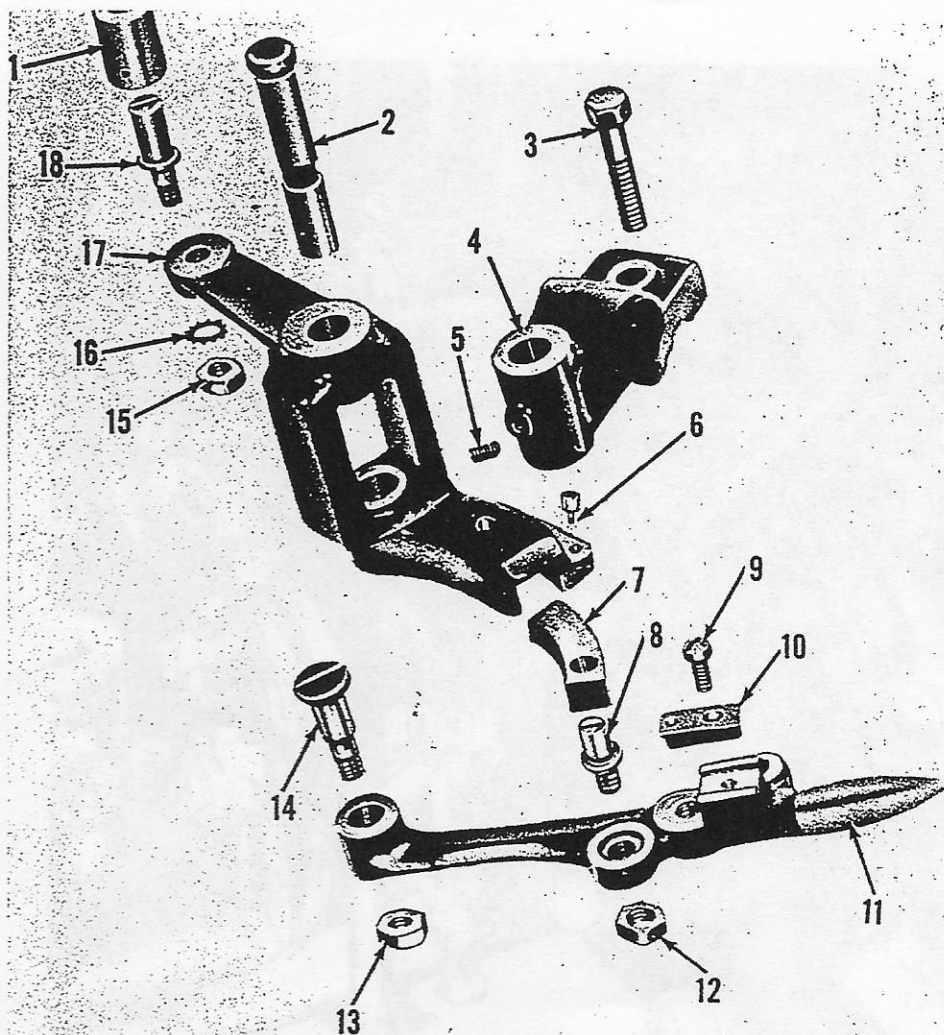
(179) Insert oil wicks (21) into wick openings and slots in retaining gib (18), wearing strip (16), and feed slide (15). Make certain ends of oil wicks on retaining gib are in oil reservoir in frame.

(180) Install retaining gib on frame (fig. 66) with screws (20) and washers

(19); screws are installed from underneath frame. Do not tighten screws completely at this time.

(181) Install feed slide wearing strip to bottom of feed slide by inserting wearing strip screws (17) through wearing strip into feed slide.

(182) Place feed adjusting lever slide block pivot stud (8, fig. 65) into feed



3B-1-65

- | | |
|--|---|
| 1 Roll | 10 Shoe feed and guide handle retaining plate |
| 2 Pivot stud | 11 Shoe feed and guide handle |
| 3 Bracket retaining screw | 12 Feed adjusting lever slide block stud nut |
| 4 Bracket | 13 Feed adjusting lever pivot stud nut |
| 5 Pivot stud setscrew | 14 Feed adjusting lever pivot stud |
| 6 Stop screw | 15 Feed cam lever roll stud nut |
| 7 Feed adjusting lever slide block | 16 External tooth lockwasher |
| 8 Feed adjusting lever slide block pivot stud | 17 Feed cam lever |
| 9 Shoe feed and guide handle retaining plate screw | 18 Roll stud |

Figure 65. Feed cam lever assembly, exploded view.

and guide handle (11), and install stud nut (12) on stud.

(183) Connect feed and guide handle to rear hole of feed adjusting lever bracket (14, fig. 67) with lever pivot stud (14, fig. 65) and stud nut (13).

(184) Place feed adjusting lever bracket on feed slide with bracket adjusting stud (11, fig. 67) between upright forks of bracket.

(185) Slide bracket over key until bracket adjusting stud is alined with bottom stud hole in feed slide, then tighten adjusting stud in feed slide bottom hole until thread hole under bracket, in key on feed slide, is alined with rear forks of bracket.

(186) Install lever bracket binding screw (12) and washer (13), fingertight,

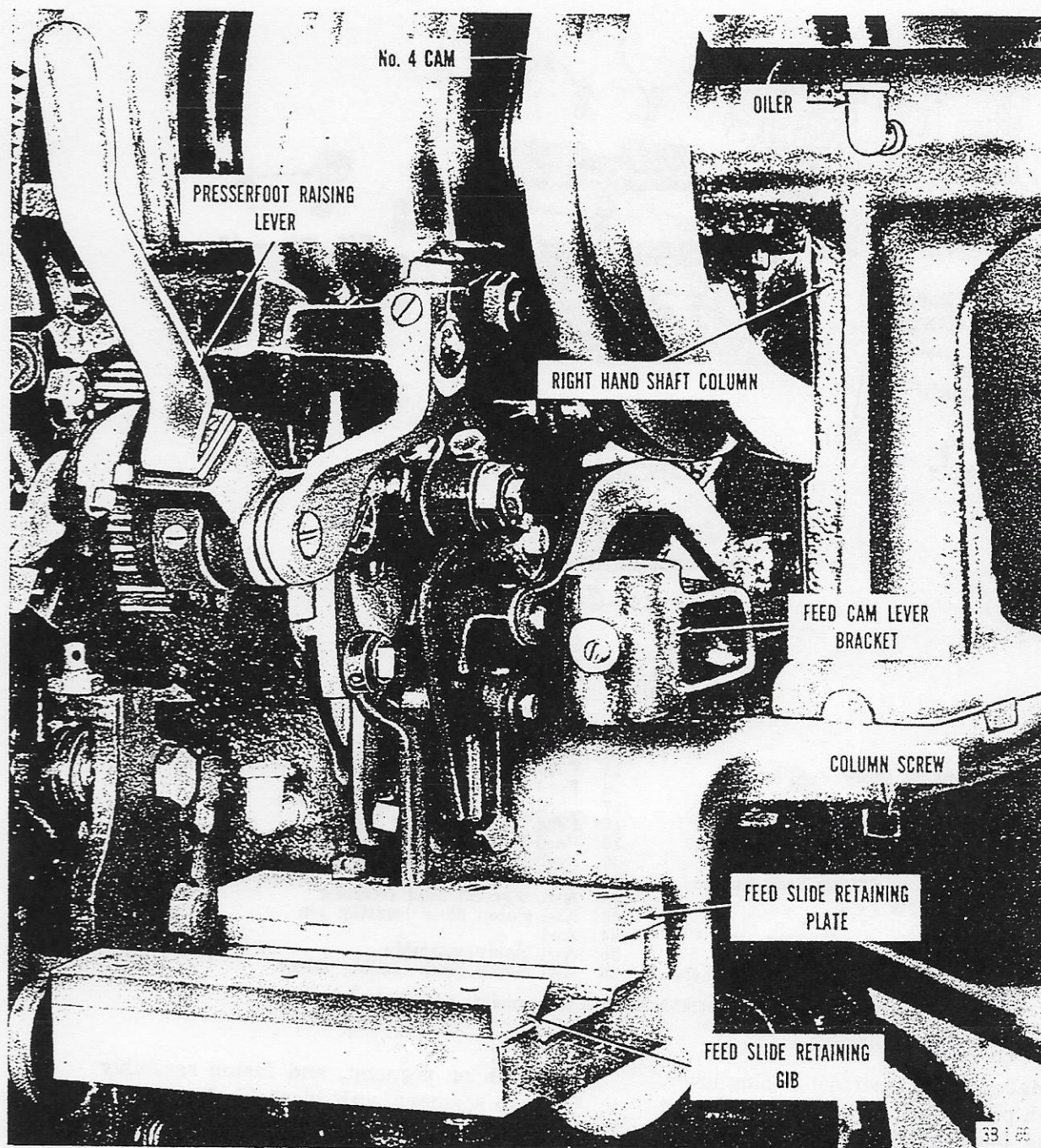


Figure 66. Feed cam lever bracket installed with right hand shaft column and No. 4 cam.

over forks of bracket (14) and into feed slide.

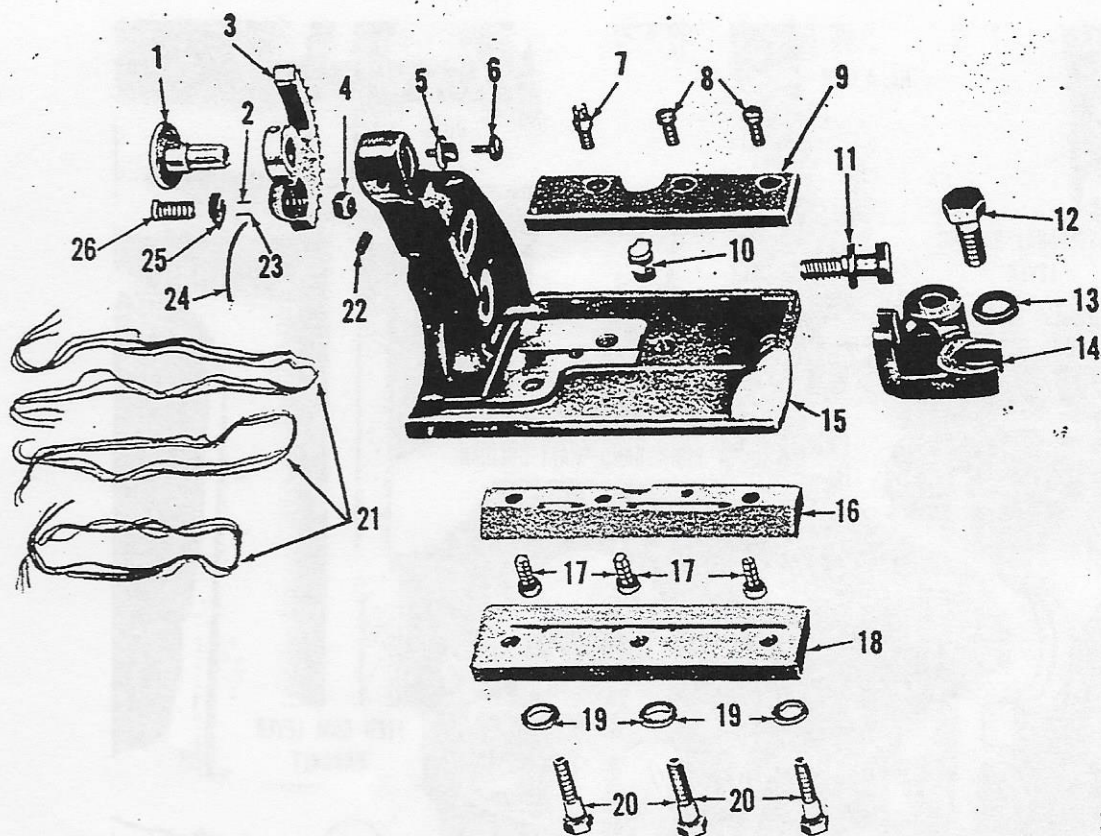
(187) Screw feed slide oiler (10) into center hole of feed slide.

(188) Install feed slide assembly with feed and guide handle on stitcher head

frame in recess formed by feed slide retaining plate and retaining gib (figs. 66 and 68).

(189) Drop ends of oil wicks into oil reservoir under feed slide.

(190) Move feed slide to left until contact



- | | | | |
|----|---|----|----------------------------------|
| 1 | Awl segment stud | 14 | Feed adjusting lever bracket |
| 2 | Awl clamp block binding screw locating pin | 15 | Feed slide |
| 3 | Awl segment | 16 | Feed slide wearing strip |
| 4 | Awl clamp block binding screw nut | 17 | Feed slide wearing strip screws |
| 5 | Awl segment stud retaining screw | 18 | Feed slide retaining gib |
| 6 | Awl segment stud retaining screw binding screw | 19 | Feed slide retaining gib washers |
| 7 | Feed slide retaining plate squarehead screw | 20 | Feed slide retaining gib screws |
| 8 | Feed slide retaining plate fillister head screws | 21 | Oil wicks |
| 9 | Feed slide retaining plate | 22 | Awl segment stud setscrew |
| 10 | Feed slide oiler | 23 | Awl clamp block locating pin |
| 11 | Feed adjusting lever bracket adjusting stud | 24 | Awl |
| 12 | Feed adjusting lever bracket binding screw | 25 | Awl clamp assembly |
| 13 | Feed adjusting lever bracket binding screw washer | 26 | Awl clamp block binding screw |

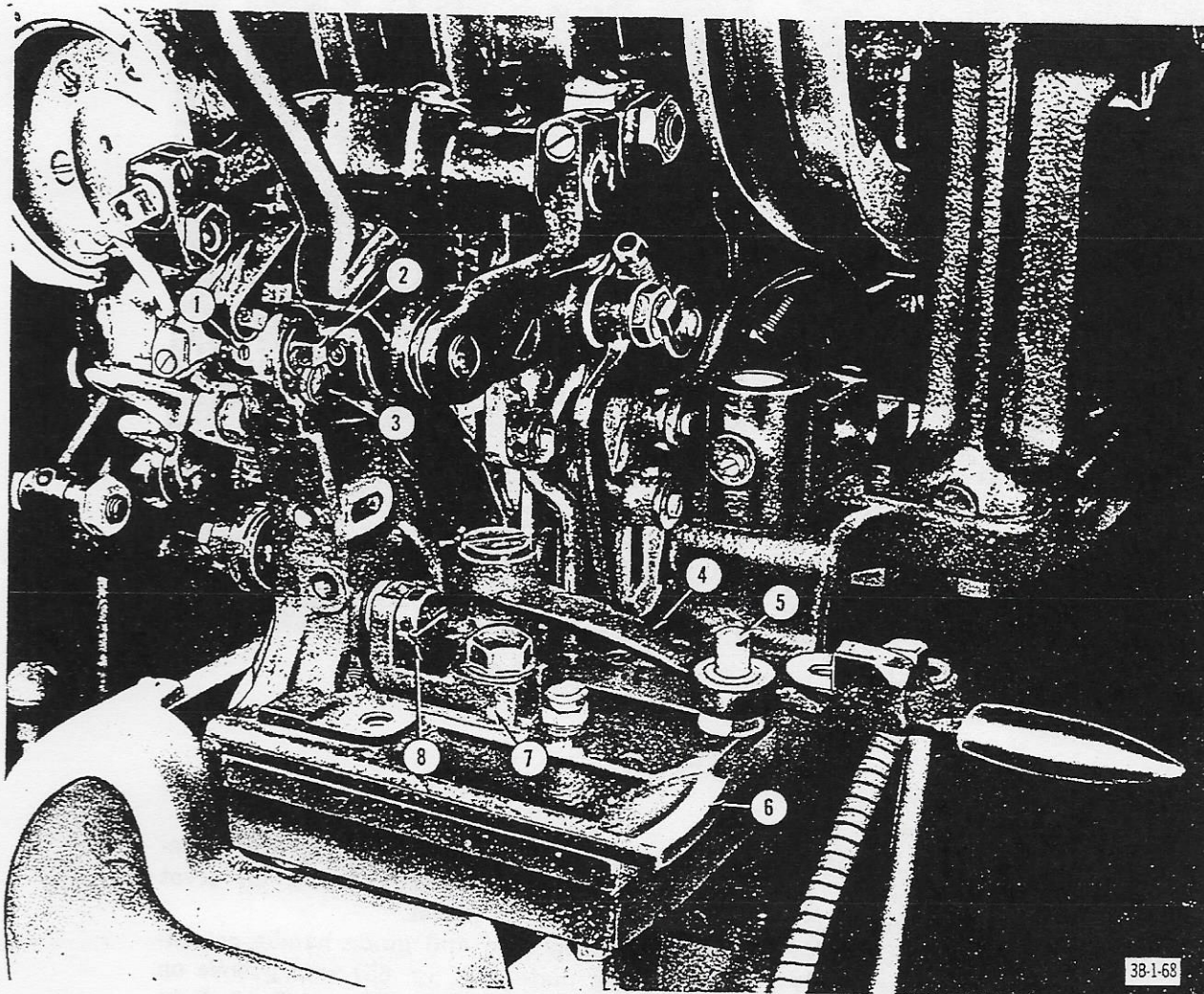
Figure 67. Feed slide assembly with awl segment, exploded view.

is made with presserfoot raising lever, push presserfoot hand lever back, and slide head of feed slide to position directly under presserfoot raising lever (fig. 68).

- (191) Tap awl clamp block locating pin (23, fig. 67) into front hole of awl segment (3), and tap block binding screw locating pin (2) into rear hole of awl clamp assembly (25).
- (192) Place awl clamp assembly on awl segment, guiding assembly on locating

pin on segment, and fasten assembly to segment with block binding screw (26) and nut (4).

- (193) Slide awl segment stud (1) into hole in segment from left to right with awl clamp facing front.
- (194) Turn cams until awl cam lever is at its lowest position.
- (195) Install assembled awl segment between head of feed slide and needle segment so that first tooth at top of awl segment will fit into slot between



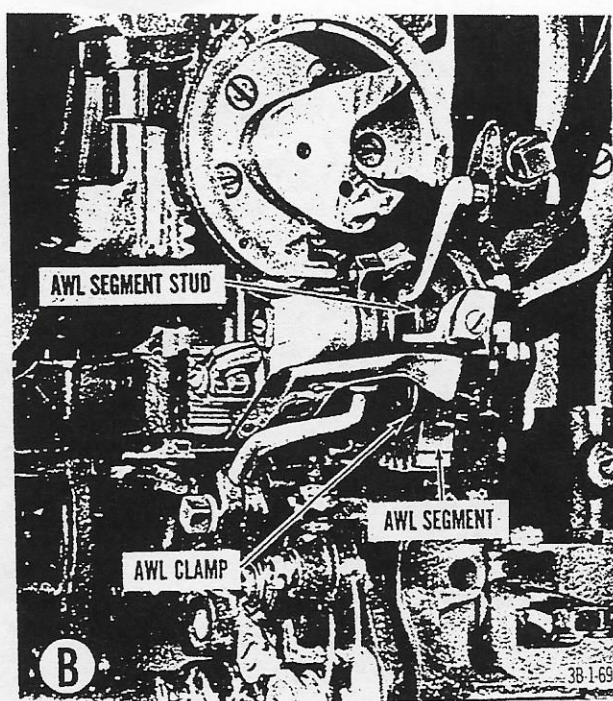
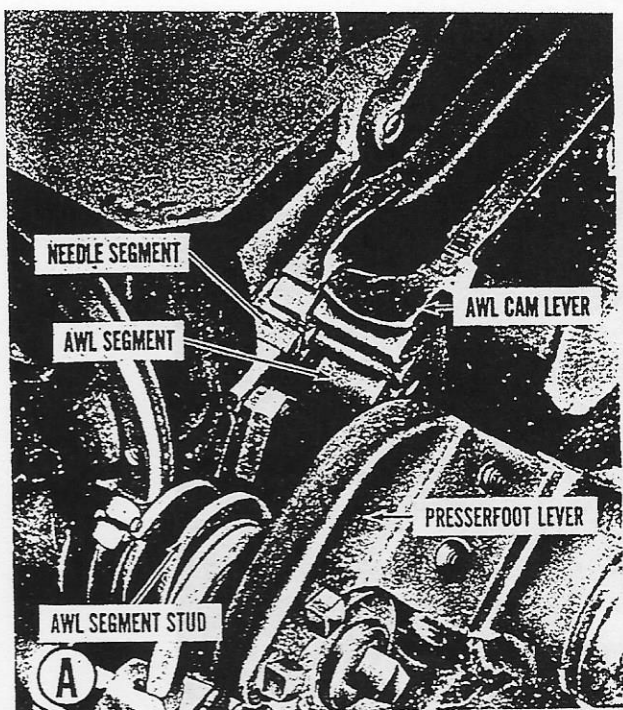
- | | |
|--|---|
| 1 Awl segment stud setscrew | 5 Feed adjusting lever slide block pivot stud |
| 2 Awl segment stud retaining screw | 6 Feed slide |
| 3 Awl segment stud retaining screw binding screw | 7 Feed adjusting lever bracket |
| 4 Feed and guide handle | 8 Feed adjusting lever bracket adjusting stud |

Figure 68. Feed slide assembly with feed and guide handle and awl segment installed.

second and third tooth of awl cam lever (A, fig. 69).

- (196) Push awl segment stud into its seat on feed slide, align setscrew seat on stud with setscrew seat on feed slide by aligning shoulder on stud with top of awl clamp, and install stud setscrew (22, fig. 67) in feed slide.
- (197) Push feed slide to left until it is flush against awl segment (B, fig. 69).
- (198) Install stud retaining screw (5, fig. 67) in end of stud and tighten screw sufficiently to remove side play from segment.

- (199) Push feed slide to right about $\frac{1}{4}$ inch so needle and awl segments will not touch each other.
- (200) Turn cams to check for binding in awl segment. If awl segment binds, loosen awl segment stud retaining screw slightly and tap screw lightly. Check again for binding. If awl segment still binds, loosen screw slightly and tap again, being careful not to loosen so much that side play occurs.
- (201) Install awl segment stud retaining screw binding screw (6) into small screw hole in head of feed slide (3,



A—Awl segment timed with awl cam lever

B—Awl segment installed

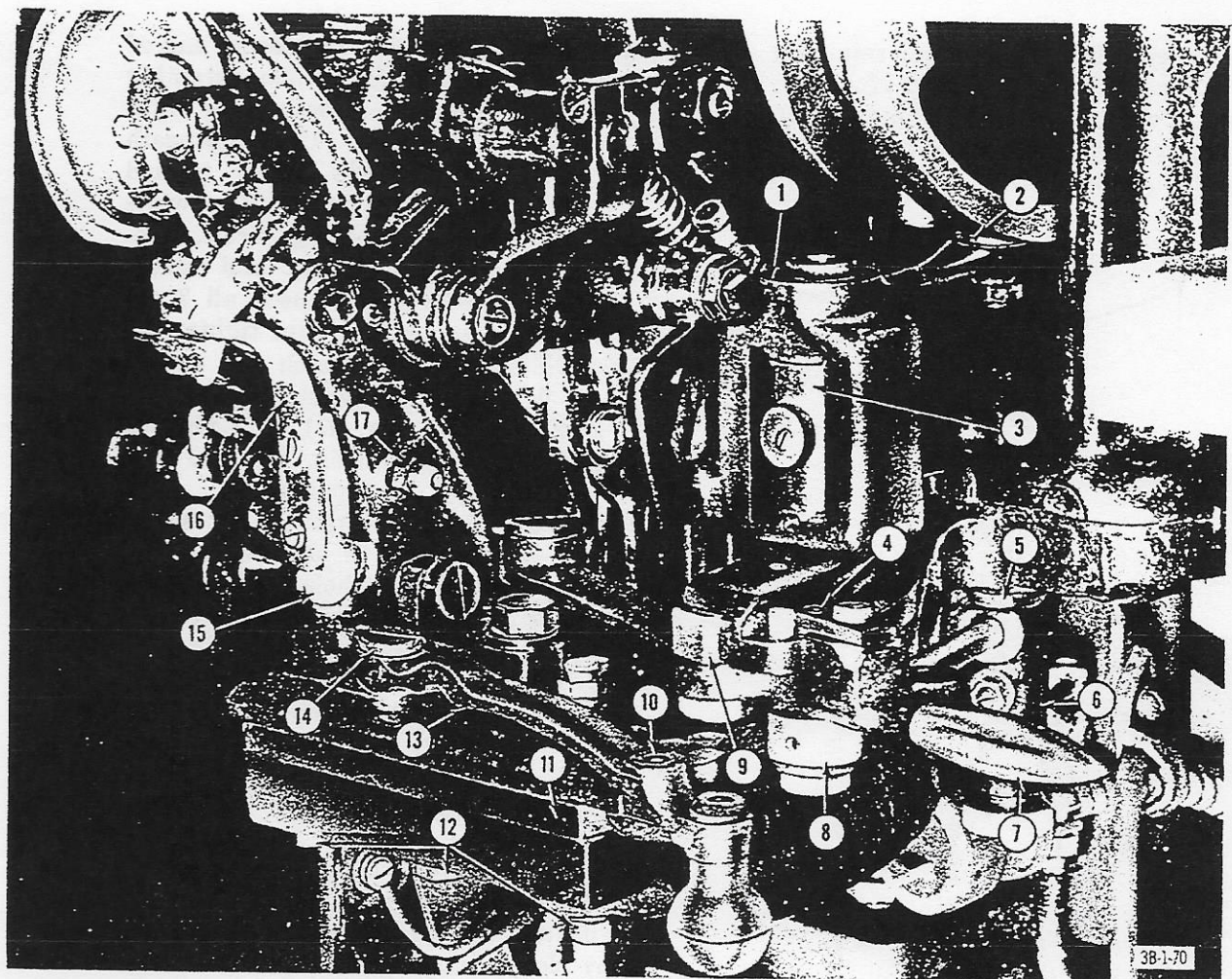
Figure 69. Awl segment installation.

fig. 68), and tighten binding screw to lock retaining screw in place.

- (202) Tighten awl segment stud setscrew (1) on setscrew seat on stud.
- (203) Place feed cam lever roll stud (18, fig. 65) into feed cam lever (17), install external tooth lockwasher (16) and stud nut (15) on stud, and fit roll (1) on stud.
- (204) Install feed cam lever stop screw (6) into hole in lever.
- (205) Fit feed adjusting lever slide block (7) over feed pivot stud (8) in shoe feed and guide handle on frame, aline slide block with slide block race on bottom of feed cam lever, and place cam lever down over slide block.
- (206) Slide feed cam lever into position on bracket by turning cams until cam lever roll can enter race on rim of No. 4 cam (2, fig. 70). Aline pivot hole in lever with stud hole of bracket.
- (207) Turn cams again until No. 4 cam is in position so offset in cam race will permit cam lever pivot stud (2, fig. 65) to enter cam race and drop into

position through cam lever pivot hole and stud hole in bracket.

- (208) Tighten pivot stud setscrew, referred to in (170) above, on pivot stud setscrew seat.
- (209) Slip feed and guide handle retaining plate (10, fig. 65) into groove on feed and guide handle. Aline hole in plate with hole in handle, making certain end of plate is over lip of feed cam lever (4, fig. 70). Install retaining plate screw (9, fig. 65) through plate and into hole in handle.
- (210) Slide feed ratchet rod (10, fig. 71) into top opening on side of swivel (4).
- (211) Fit feed ratchet plunger (5) into hole in bottom of swivel, and slide plunger spring (6) into bottom of plunger.
- (212) Tighten plunger locking screw (7) in bottom of swivel until neck of screw is visible in bottom hole on side of swivel.
- (213) Tighten plunger locking screw retaining screw (11) in bottom hole in



- | | |
|---|--|
| 1 Feed cam lever | 10 Shoe guide shifter handle tension screw |
| 2 Feed cam lever roll | 11 Feed slide retaining gib |
| 3 Feed cam lever bracket | 12 Feed slide retaining gib screws |
| 4 Feed and guide handle retaining plate | 13 Shoe guide shifter handle |
| 5 Feed slide ratchet plunger swivel bearing screw | 14 Shoe guide shifter handle pivot stud |
| 6 Feed slide ratchet plunger swivel | 15 Shoe guide bracket |
| 7 Feed and guide handle | 16 Shoe guide |
| 8 Feed slide ratchet rod | 17 Shoe guide latch pin thumb nut |
| 9 Feed slide adjusting lever slide block | |

Figure 70. Feed cam lever, feed slide ratchet control, and shoe guide on frame.

side of swivel enough to touch neck of locking screw.

(214) Tighten plunger retaining screw (2) in middle hole in side of swivel against seat of ratchet plunger, and install retaining screw nut (13) on retaining screw.

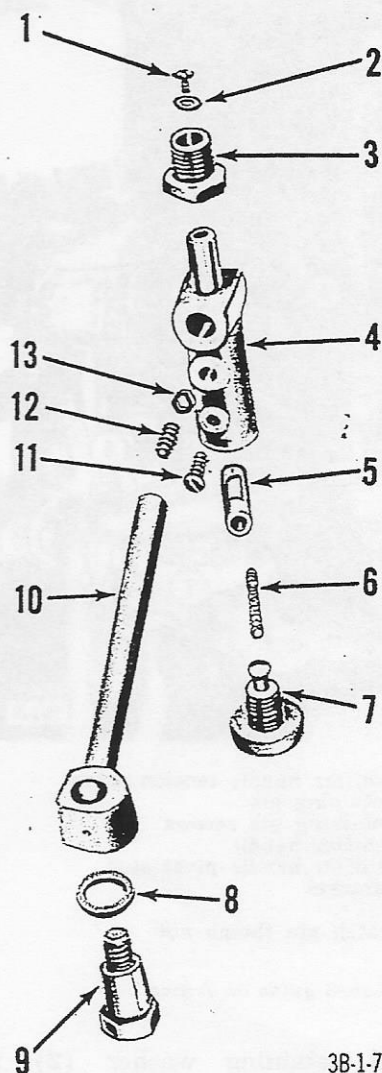
(215) Place ratchet plunger swivel bearing screw (3) on top of swivel with thread of screw at top, and hold with

swivel retaining washer (2) and screw (1).

(216) Connect feed ratchet swivel assembly on stitcher head frame by installing swivel bearing screw into opening on frame under right camshaft column (5, fig. 70).

(217) Place pivot end of feed ratchet rod underneath opening next to retaining plate in feed and guide handle (8, fig. 70).

- (218) Slide ratchet rod stud retaining washer (8, fig. 71) on rod stud (9), and fit stud into hole from underneath to attach pivot end of rod to feed and guide handle.

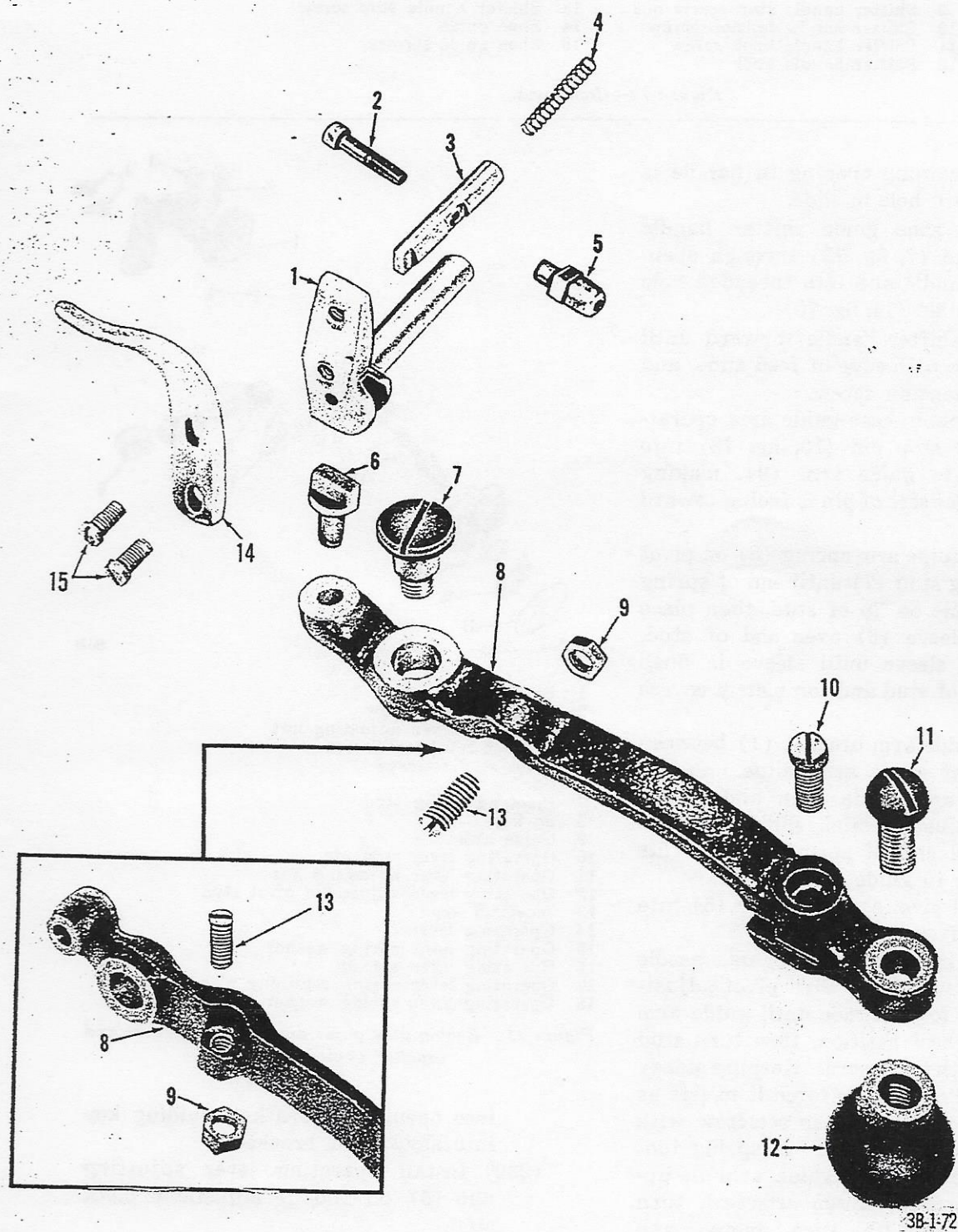


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- 1 Swivel retaining washer screw
- 2 Swivel retaining washer
- 3 Plunger swivel bearing screw
- 4 Swivel
- 5 Plunger
- 6 Plunger spring
- 7 Plunger locking screw
- 8 Rod stud retaining washer
- 9 Rod stud
- 10 Rod
- 11 Plunger locking screw retaining screw
- 12 Plunger retaining screw
- 13 Plunger retaining screw nut

Figure 71. Feed slide ratchet control, exploded view.

- (219) Adjust feed slide by placing end of screwdriver on feed slide retaining gib (11, fig. 70), directly over right gib retaining screw (12) underneath frame, pressing gib firmly toward rear, and holding in position while tightening gib retaining screw. Repeat procedure for left and center retaining screws. Recheck all 3 gib retaining screws for firm tightening.
- (220) Slide shoe guide latch pin spring (4, fig. 72) into opening on front of feed slide (15, fig. 67), and fit shoe guide latch pin (3, fig. 72) into feed slide opening over spring.
- (221) Insert latch pin thumb nut screw (2) into opening in left side of feed slide and through hole in latch pin, and screw thumb nut (5) on extended end of thumb nut screw (17, fig. 70).
- (222) Install shoe guide (14, fig. 72) to bracket (1) with screws (15).
- (223) Place shifter handle knob screw (11) through hole in handle (8), and screw handle knob (12) on end of knob screw.
- (224) Screw shifter handle tension screw (10) into threaded hole of handle but do not tighten screw at this time.
- (225) Screw handle stop screw (13) into handle, and install stop screw nut (9) on screw.
- (226) Fit shifter handle pin (6) into hole at left end of handle.
- (227) Hold shifter handle in right hand and use left hand to place shoe guide bracket and shoe guide on handle pin, fitting lip on pin into channel on bracket.
- (228) Place shoe guide assembly on feed slide (16, fig. 70), inserting shoe guide bracket shaft into lower opening on front of feed slide. Slide shoe guide shifter handle on feed slide, making certain feed slide plate rides between forks of handle beneath tension screw (10).
- (229) Push shoe guide bracket into opening in feed slide, fitting end of shoe guide latch pin into slot on back of bracket. At the same time, push shoe guide handle toward rear of feed slide



- | | |
|-----------------------------|-----------------------------|
| 1 Bracket | 5 Latch pin thumb nut |
| 2 Latch pin thumb nut screw | 6 Shifter handle pin |
| 3 Latch pin | 7 Shifter handle pivot stud |
| 4 Latch pin spring | 8 Shifter handle |

Figure 72. Shoe guide assembly, exploded view.

- | | |
|---------------------------------|------------------------------|
| 9 Shifter handle stop screw nut | 13 Shifter handle stop screw |
| 10 Shifter handle tension screw | 14 Shoe guide |
| 11 Shifter handle knob screw | 15 Shoe guide screws |
| 12 Shifter handle knob | |

Figure 72—Continued.

until remaining opening in handle is alined with hole in slide.

(230) Insert shoe guide shifter handle pivot stud (7, fig. 72) through opening in handle and into threaded hole on feed slide (14, fig. 70).

(231) Slide shifter handle forward until it is flush with edge of feed slide, and tighten tension screw.

(232) Tap bobbin case guide arm operating lever stop pin (10, fig. 73) into opening in guide arm (9), making certain flat side of pin is facing toward right.

(233) Slide guide arm spring (8) on pivot adjusting stud (7) until end of spring fits in hole on lip of stud, then place spring sleeve (6) over end of stud, and tap sleeve until sleeve is flush with lip of stud and completely covers spring.

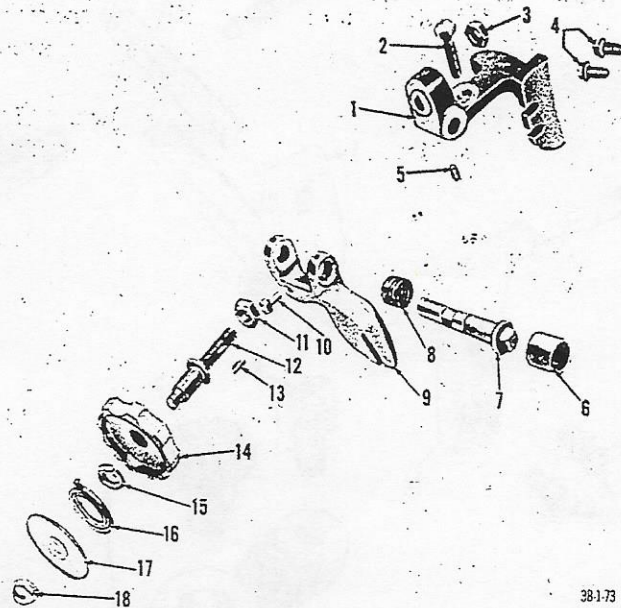
(234) Fit guide arm bracket (1) between prongs of guide arm, aline holes in bracket and guide arm, and install pivot adjusting stud, sliding stud to left until end of spring on stud fits into hole in guide arm.

(235) Install pivot stud setscrew (5) into bracket from underneath.

(236) With guide arm loose, use needle and awl wrench to turn pivot adjusting stud toward rear until guide arm is at highest position, then turn stud one-fourth turn more. Keeping steady pressure on stud to force it to left as far as possible, tighten setscrew with needle guide wrench. If spring tension will not keep guide arm in upward position, loosen setscrew, turn stud one-fourth turn more, and tighten setscrew.

(237) Screw operating lever adjusting nut (11) on adjustable pivot stud (12) until nut is against lip on stud.

(238) Fit woodruff key (13) into key seat of pivot stud, and install end of stud



- 1 Bracket
- 2 Bracket brace screw
- 3 Operating lever adjusting nut
- 4 Bracket retaining screws
- 5 Pivot stud setscrew
- 6 Spring sleeve
- 7 Pivot adjusting stud
- 8 Spring
- 9 Guide arm
- 10 Operating lever stop pin
- 11 Operating lever adjusting nut
- 12 Operating lever adjustable pivot stud
- 13 Woodruff key
- 14 Operating lever
- 15 Operating lever spring washer
- 16 Operating lever spring
- 17 Operating lever spring retaining plate
- 18 Operating lever spring washer locking nut

Figure 73. Bobbin case guide arm operating lever and bracket, exploded view.

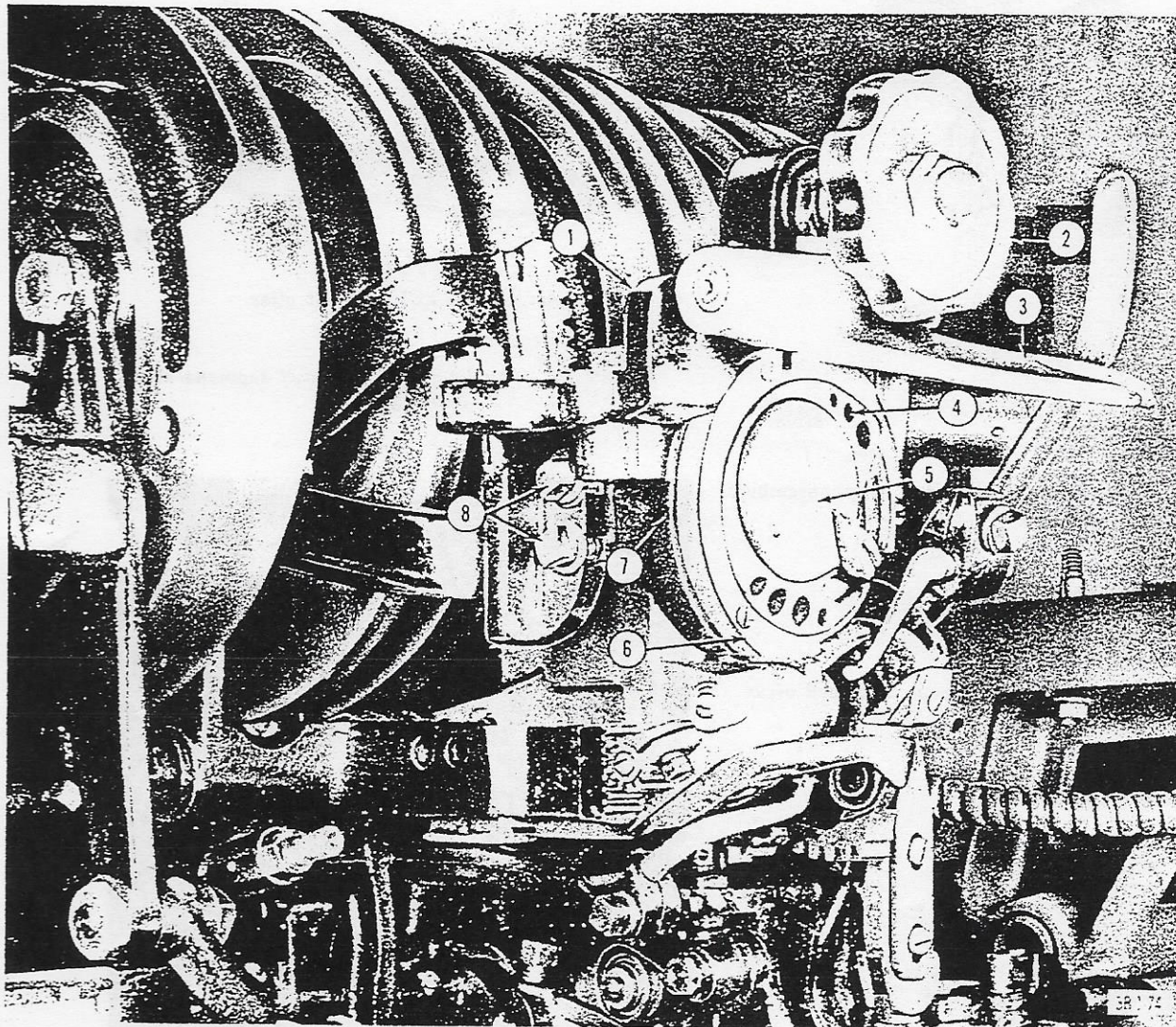
into opening in bracket, guiding key into keyway of bracket.

(239) Install operating lever adjusting nut (3) on end of adjustable pivot stud.

(240) Place operating lever (14) on opposite end of adjustable pivot stud and install spring washer (15), fitting slots on inside of washer on positioning pins and spring grooves on outside of washer at top (B, fig. 25).

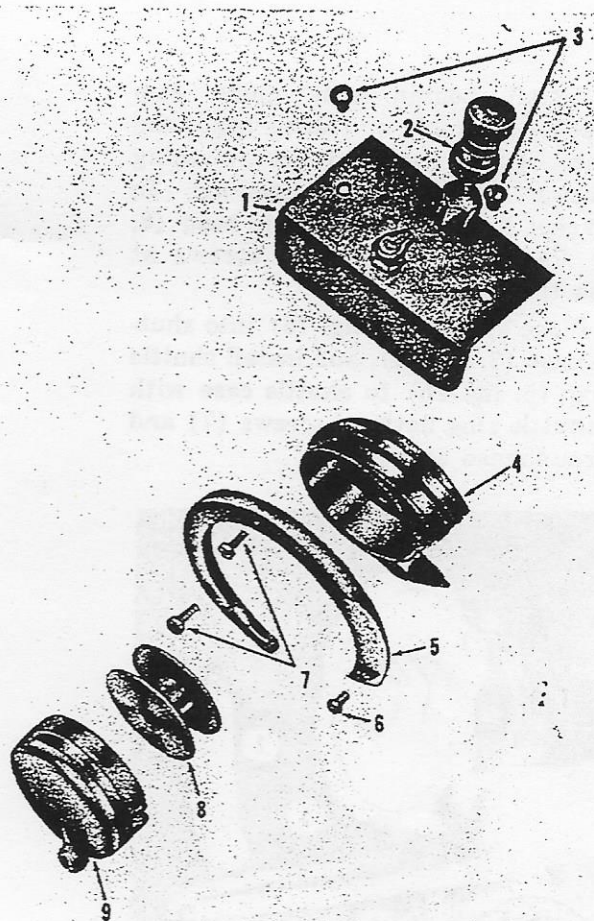
- (241) Place operating lever spring (16, fig. 73) over adjustable pivot stud and inside operating lever, and push protruding flange on inside of spring into left hand slot on outside of washer. If spring is too loose, move flange to right hand slot. Fit protruding flange on outside of spring on stud on inside of operating lever.
- (242) Install spring retaining plate (17) and locking nut (18) on adjustable pivot stud.

- (243) Install bobbin case guide arm bracket assembly on shuttle head, and insert guide arm bracket retaining screws (4) through openings in bracket into holes in shuttle head (8, fig. 74). Do not tighten screws at this time.
- (244) Place shuttle (4, fig. 75) into shuttle case (7, fig. 74), and install shuttle ring (5, fig. 75) to shuttle case with 2 shuttle ring flathead screws (7) and 1 roundhead screw (6).

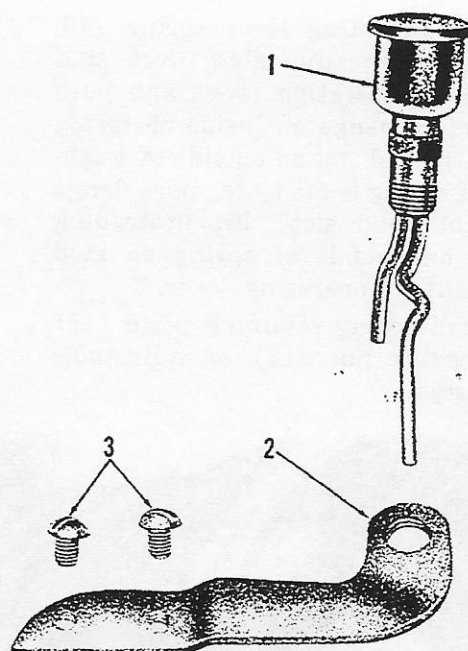


- | | |
|---------------------|----------------------------|
| 1 Guide arm bracket | 5 Bobbin case |
| 2 Operating lever | 6 Shuttle ring |
| 3 Guide arm | 7 Shuttle case |
| 4 Shuttle | 8 Bracket retaining screws |

Figure 74. Bobbin case guide arm lever and bracket installed.



38-1-75



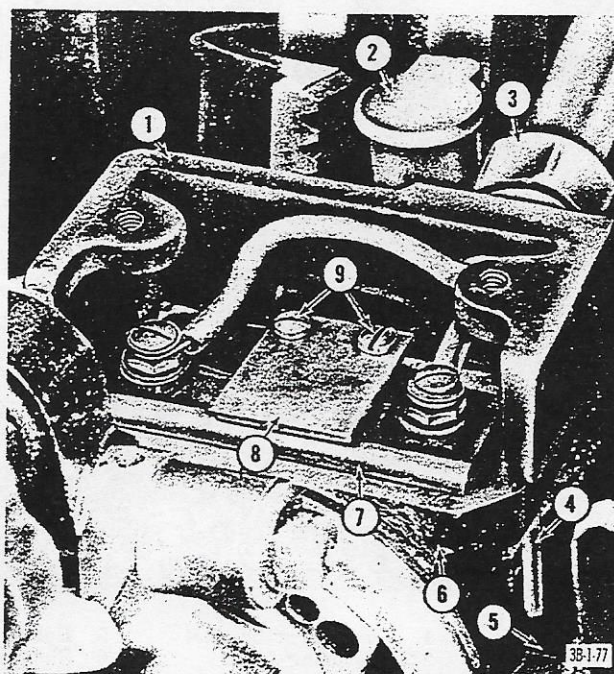
38-1-75

- 1 Shuttle driver and awl segment oiler
- 2 Bracket
- 3 Bracket screws

Figure 76. Shuttle driver and awl segment oiler, exploded view.

- 1 Shuttle heat unit guard cover with oilcup, assembled
- 2 Cam cover lock assembly
- 3 Shuttle heat unit guard cover screws
- 4 Shuttle
- 5 Shuttle ring
- 6 Shuttle ring roundhead screw
- 7 Shuttle ring flathead screws
- 8 Bobbin
- 9 Bobbin case assembly

Figure 75. Shuttle with bobbin case, exploded view.



38-1-77

- 1 Shuttle heat unit guard
- 2 Shuttle driver and awl segment oiler
- 3 Shuttle heat unit wiring conduit
- 4 Oil pipe for awl segment
- 5 Awl segment
- 6 Shuttle case
- 7 Shuttle heat unit
- 8 Shuttle heat unit clamp
- 9 Shuttle heat unit clamp retaining screws

Figure 77. Shuttle driver and awl segment oiler with shuttle heat unit installed.

(245) Place bobbin (8) into bobbin case assembly (9), and slide bobbin case into shuttle with horn on bobbin case facing down (5, fig. 74). Bring down bobbin case guide arm lever.

(246) Slip shuttle driver and awl segment oiler assembly (1, fig. 76) into opening in bracket (2), being careful not to bend oil pipes of oiler. Screw oiler assembly into bracket as far as possible, making certain oilcup lid hinge faces toward rear.

(247) Place bracket and oiler assembly on bobbin case guide arm bracket (1, fig. 74), alining holes in oiler bracket with holes at rear of guide arm bracket. Make certain end of short oil pipe on oiler assembly is in shuttle driver hole on top of shuttle head and end of long

oil pipe is directly over awl segment (4, fig. 77).

(248) Install bracket screws (3, fig. 76) through oiler bracket and into holes in bobbin case guide arm bracket.

(249) Install shuttle heat unit clamp (8, fig. 77) to flat top of shuttle case (6) with 2 retaining screws (9), and handtighten screws.

(250) Bring wiring conduit (3) up from rear with shuttle heat unit (7) and heat unit guard (1) and fit conduit between No. 2 and No. 3 cams.

(251) Place shuttle heat unit guard, with heat unit and wiring, on top of shuttle case, slide heat unit under clamp, and tighten retaining screws referred to in step (249) above.

(252) Aline hole in shuttle heat unit guard

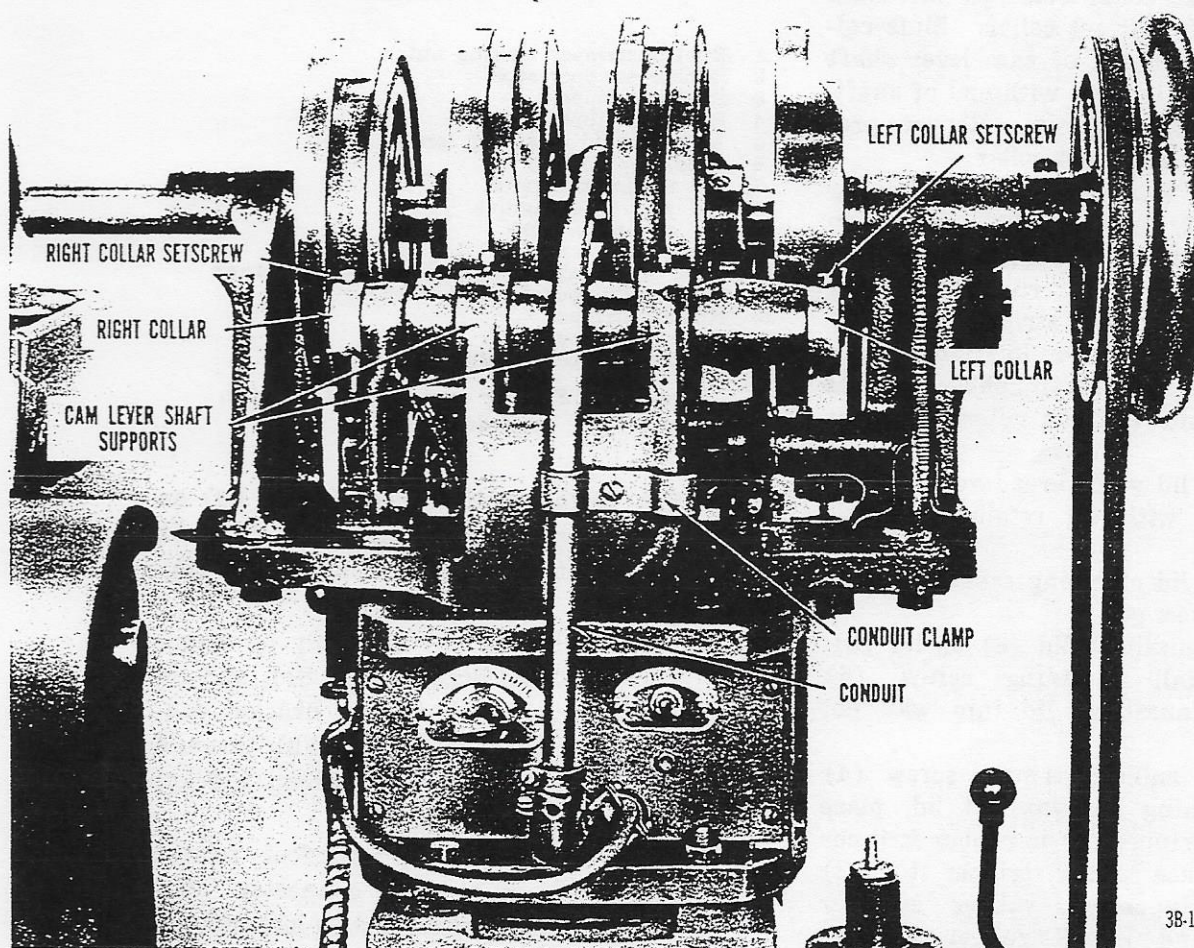


Figure 78. Cam lever shaft set collars installed on cam lever shaft.

(4, fig. 31) with hole in bobbin case guide arm bracket (1, fig. 74) and hole in shuttle case (7), and install bobbin case guide arm bracket brace screw (2, fig. 73) through holes.

(253) Tighten bobbin case guide arm bracket retaining screws referred to in step (243) above.

(254) Place shuttle heat unit guard cover (1, fig. 75) on heat unit guard with end of oil pipe inserted into oilhole in flat top on front of shuttle case, and install shuttle heat unit guard cover screws (3) to hold cover to guard.

(255) Place clamp at rear of stitcher head frame over shuttle heat unit wiring conduit (fig. 78), and handtighten clamp screw.

(256) Refer to figure 78, and install cam lever shaft collar setscrew into cam lever shaft left set collar. Slide collar over left end of cam lever shaft until collar is flush with end of shaft, and tighten setscrew. Repeat procedure for right set collar.

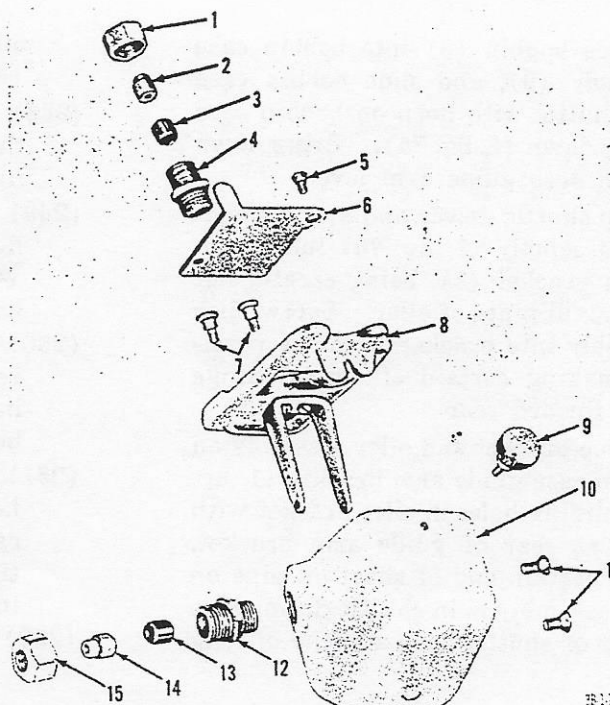
(257) Install wax pot rubber stripper screw (12, fig. 79) into opening on side of wax pot (10), place rubber stripper (13) in rubber stripper screw, place rubber stripper stud (14) over rubber stripper in rubber stripper screw, and install rubber stripper binding nut (15) on rubber stripper screw.

(258) Install lid with thread guide (8) to wax pot with lid retaining screws (7).

(259) Install lid clamping screw (9) into hole in wax pot.

(260) Place auxiliary lid (6) on lid (8), and install retaining screw (5) through auxiliary lid into wax pot lid.

(261) Install rubber stripper screw (4) into opening on wax pot lid, place rubber stripper (3) in rubber stripper screw, place rubber stripper stud (2) over stripper in rubber stripper screw, and install rubber stripper binding nut (1) on rubber stripper screw.



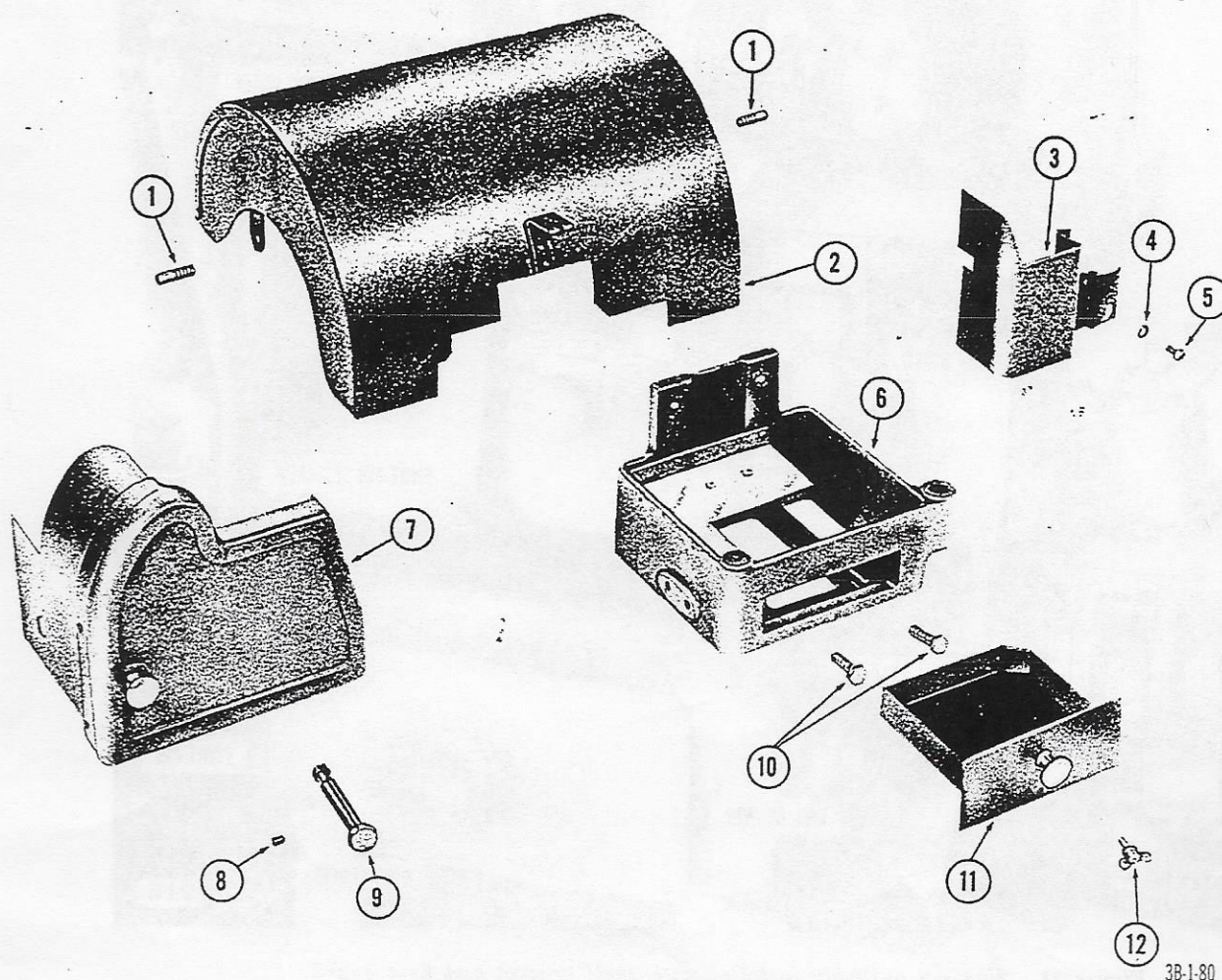
- 1 Rubber stripper binding nut
- 2 Rubber stripper stud
- 3 Rubber stripper
- 4 Rubber stripper screw
- 5 Auxiliary lid retaining screw
- 6 Auxiliary lid
- 7 Lid retaining screws
- 8 Lid with thread guide
- 9 Lid clamping screw
- 10 Wax pot
- 11 Wax pot-to-takeup bracket connecting screws
- 12 Rubber stripper screw
- 13 Rubber stripper
- 14 Rubber stripper stud
- 15 Rubber stripper binding nut

Figure 79. Stitcher wax pot and stripper, exploded view.

(262) Install shelf bracket (6, fig. 80) on stitcher head frame with 2 shelf bracket screws (10) into frame (fig. 81).

(263) Place wax pot assembly on auxiliary takeup bracket (fig. 81), and install wax pot-to-takeup bracket connecting screws (11, fig. 79) through openings in rear of takeup bracket into holes in wax pot.

(264) Slip forks of presserfoot release treadle upper rod connector over opening in presserfoot-to-lock release lever shaft (fig. 82). Tap upper rod connector stud through holes in fork



38-1-80

- | | |
|---|--|
| 1 Cam cover pivot studs | 7 Heat guard |
| 2 Cam cover | 8 Heat guard pivot pin setscrew |
| 3 Heat guard cover plate | 9 Heat guard pivot pin |
| 4 Heat guard cover plate retaining screw washer | 10 Shelf bracket screws |
| 5 Heat guard cover plate retaining screw | 11 Wax pot drip drawer |
| 6 Shelf bracket | 12 Wax pot drip drawer retaining screw |

Figure 80. Cam cover, shelf bracket, and heat guard.

- of rod connector and hole in lever, and tighten stud.
- (265) Place heat guard cover plate (3, fig. 80) on right side of auxiliary takeup bracket over heat units, and install retaining screw (5) and washer (4) to hold plate to frame.
- (266) Place heat guard (7) on right hand side of shelf bracket (6), alining hole in heat guard with hole in shelf bracket, insert heat guard pivot pin (9) from underneath, through pivot pin hole in shelf bracket and into stud

hole of heat guard, and install heat guard pivot pin setscrew (8) on setscrew seat of pivot pin.

- (267) Slide wax pot drip drawer (11) into shelf bracket, and tighten retaining screw (12) in shelf bracket to hold drawer in place.
- (268) Slip cam cover (2) over cams, with brackets of cover alined with ends of cam lever shaft, insert cam cover pivot studs (1) through openings in cover brackets and into holes in end of cam lever shaft, and tighten studs.

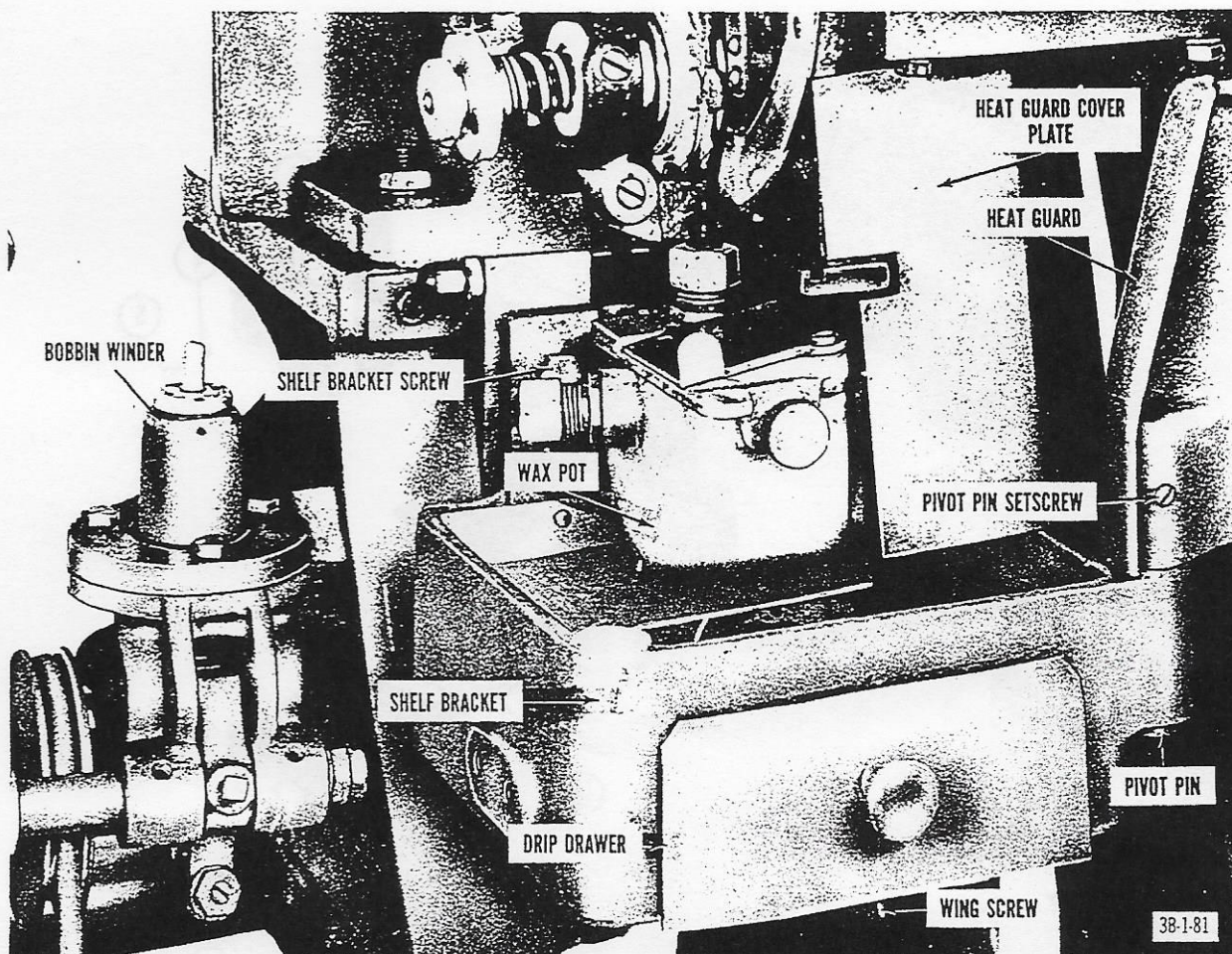


Figure 81. Wax pot assembly installed with shelf bracket and heat guard.

- (269) Connect assembled work light fixture by placing base of work light on top of cam cover and installing 2 screws through holes of base and into cam cover.
- (270) Loosen screw in wiring conduit clamp on back of stitcher head frame and place work light wiring conduit under clamp; tighten screw.
- (271) Install stitcher drive belt and bobbin winder drive belt (par 60d).
- (272) Swing cam cover to rear of head to have head free for installation of awl and needle and for final adjustments. Replace cam cover when

adjustments and tests are completed.

b. Adjustments.

- (1) Install and adjust needle (par. 45)
- (2) Install and adjust awl (par. 47).
- (3) Adjust needle guide (par. 46).
- (4) Adjust lifter (par. 48).
- (5) Adjust looper (par. 49).
- (6) Adjust auxiliary takeup lever and spring (par. 52).
- (7) Check adjustment of presserfoot (par. 53).

c. Run-in Test. The stitching machine should be given a thorough and complete inspection (par. 15) and run-in test (par. 17) with final adjustments.

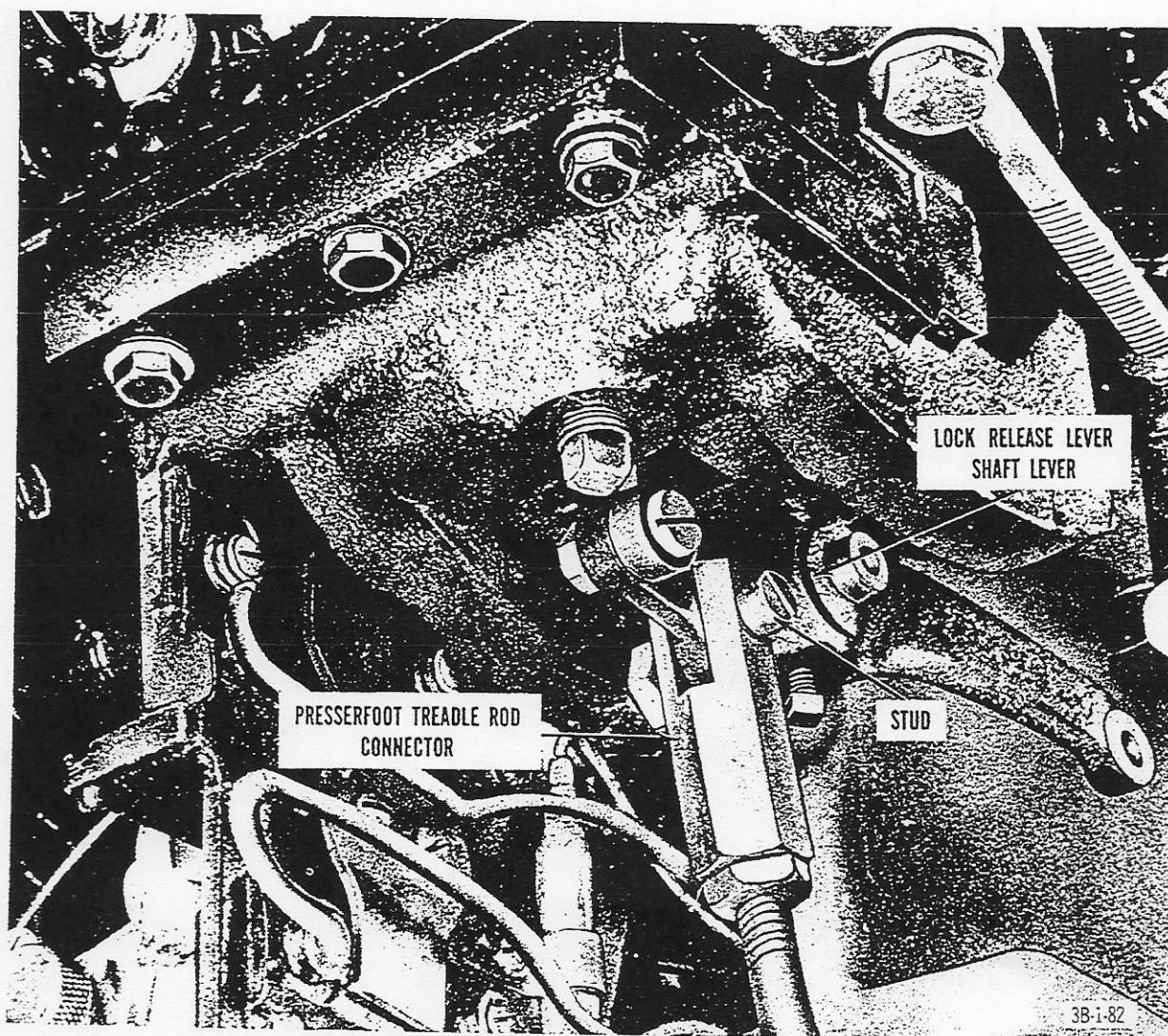


Figure 82. Treadle rod connector installed on lock release lever shaft lever

Section III. PRESSERFOOT RELEASE TREADLE ASSEMBLY

66. General

The presserfoot release treadle (par. 26) is connected to the head assembly by a connecting rod attached to the presserfoot-to-lock and tension release shaft lever (fig. 82).

67. Assembly Procedure

a. General. The presserfoot release treadle assembly is assembled as it is installed on the frame of the Model 12K-100 Special portable shoe repair unit.

- | | |
|---------------------------|--|
| 1 Bracket retaining nuts | 10 Squarehead setscrew |
| 2 Bracket washers | 11 Upper rod connector stud |
| 3 Pivot shaft | 12 Upper rod connector |
| 4 Bracket | 13 Upper rod connector locknut |
| 5 Bracket retaining bolts | 14 Rod |
| 6 Pivot shaft setscrew | 15 Lower rod connector locknut |
| 7 Treadle | 16 Lower rod connector pin cotter pins |
| 8 Machine bolt | 17 Lower rod connector pin |
| 9 Spring | 18 Lower rod connector |

Figure 83. Presserfoot release treadle assembly, exploded view.

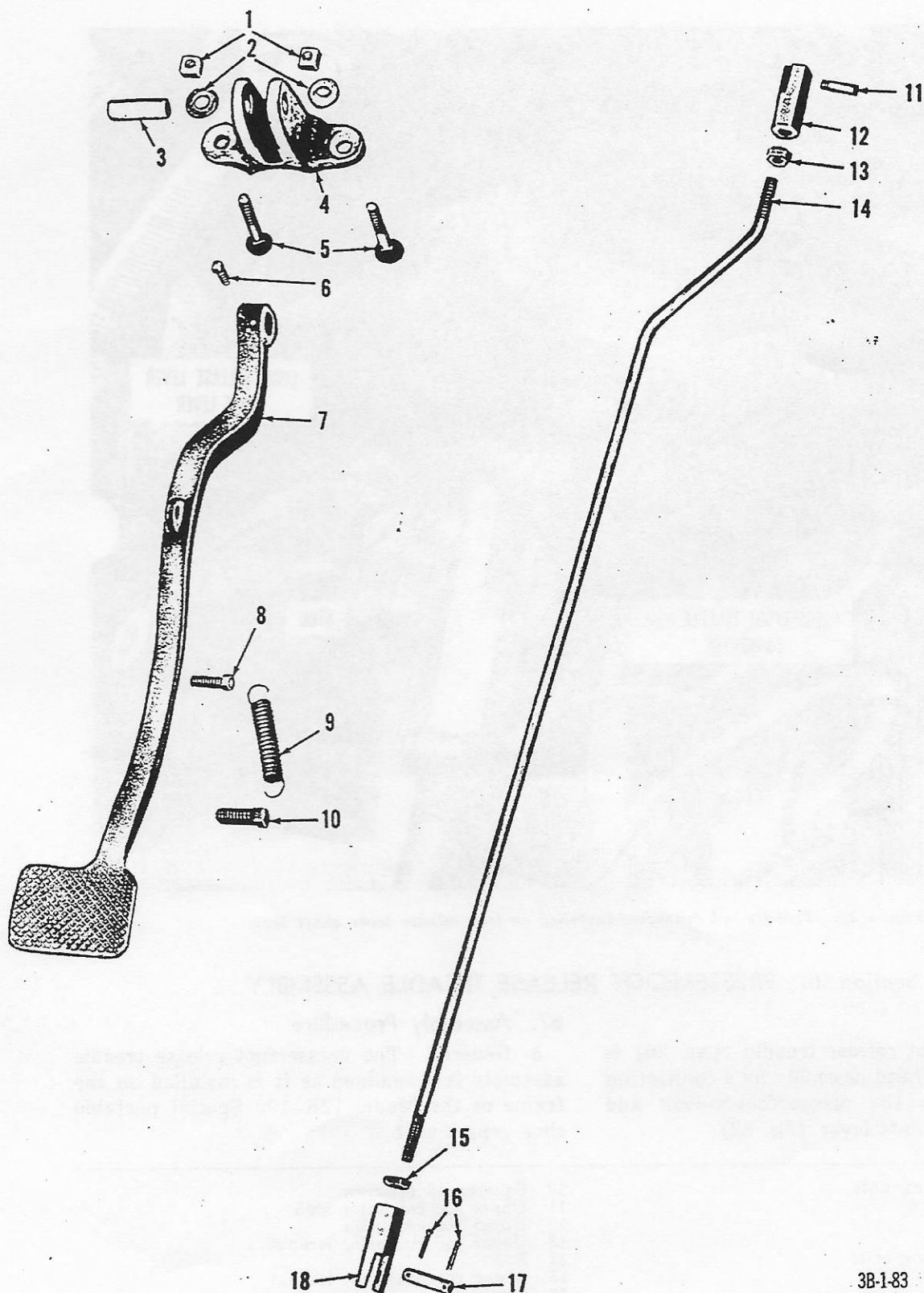


Figure 83—Continued.

3B-1-83

b. Method. The following steps indicate the method of assembling the presserfoot release treadle assembly.

- (1) Connect presserfoot release treadle bracket (4, fig. 83) to wooden frame of stitcher-finisher machine (fig. 84), with bracket retaining bolts (5, fig. 83) installed up through holes in wooden frame. Install washers (2) and nuts (1) on bolts.
- (2) Position treadle (7) between arms of bracket, install pivot shaft (3) to hold treadle to bracket, and install pivot shaft setscrew (6) in treadle end.
- (3) Install machine bolt (8) into hole in side of release treadle, and square-head setscrew (10) into hole in stitcher stand above treadle, and attach spring (9) from bolt to setscrew (fig. 84).

- (4) Screw lower rod connector locknut (15, fig. 83) on rod (14) until 4 threads on rod show below locknut, and screw lower rod connector (18) on rod until connector touches locknut. Repeat procedure for upper rod connector locknut (13) and upper rod connector (12).
- (5) Slip forks of lower rod connector over protruding eye on top of treadle (fig. 84), install lower rod connector pin (17, fig. 83) to hold rod to treadle, and install cotter pins (16) in ends of pin.
- (6) Slip forks of upper rod connector over opening in presserfoot-to-lock release lever shaft lever (3, fig. 59), and install upper rod connector stud (11, fig. 83) to hold rod to lever (fig. 82).

Section IV. BOBBIN WINDER ASSEMBLY

68. Operation

The bobbin winder is turned from the drive shaft by a drive belt attached to an idler pulley. When the shifter lever is pulled forward, it presses the idler pulley against a driven pulley which rotates the shaft. When the shifter handle is pushed backward, it pulls the idler pulley from the driven pulley and, at the same time, moves a stop lever against the driven pulley.

69. Assembly Procedure

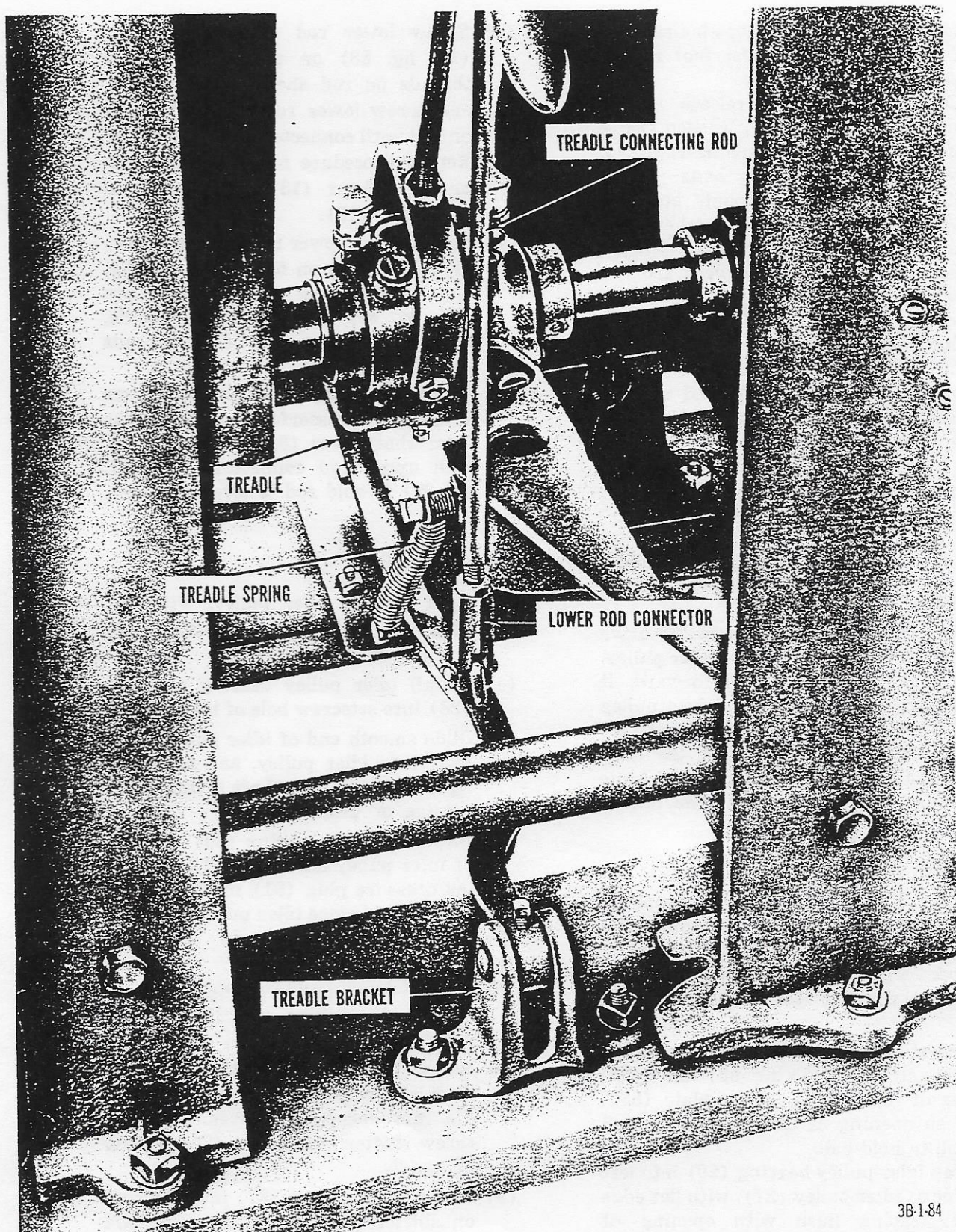
a. General. The bobbin winder is completely assembled, with the exception of the drive belt, before being installed on the unit frame.

b. Method. The following steps indicate the method of assembling the bobbin winder assembly.

- (1) Insert bobbin winder pulley thrust plate steel ball (34, fig. 85) into opening of idler pulley thrust plate (33). Peen opening of thrust plate around ball to hold ball.
- (2) Tap idler pulley bearing (29) into left side of idler pulley (27), with flat edge of bearing flush with opening of pulley.
- (3) Tap idler pulley bearing (26) into

right side of idler pulley, with flat edge of bearing flush with other opening of pulley.

- (4) Install idler pulley bearing setscrew (28) into setscrew hole of idler pulley.
- (5) Slide smooth end of idler pulley shaft (25) into idler pulley, and tap shaft lightly to left until shaft is flush with outside of pulley.
- (6) Slip idler pulley spring (30) into end of idler pulley shaft, install idler pulley pressure plug (31) in idler pulley spring, and place idler pulley pressure plug steel ball (32) in recess on pressure plug.
- (7) Install idler pulley thrust plate to end of idler pulley with thrust plate retaining screws (35).
- (8) Screw shifter handle knob (4) on shifter handle (5), insert end of handle into opening of lever (7), and screw shifter handle nut (36) on end of handle.
- (9) Place woodruff key (37) into key seat on shifter lever shaft (8), fit shaft into opening of shifter lever (7), guiding key into keyway until thread-



3B-1-84

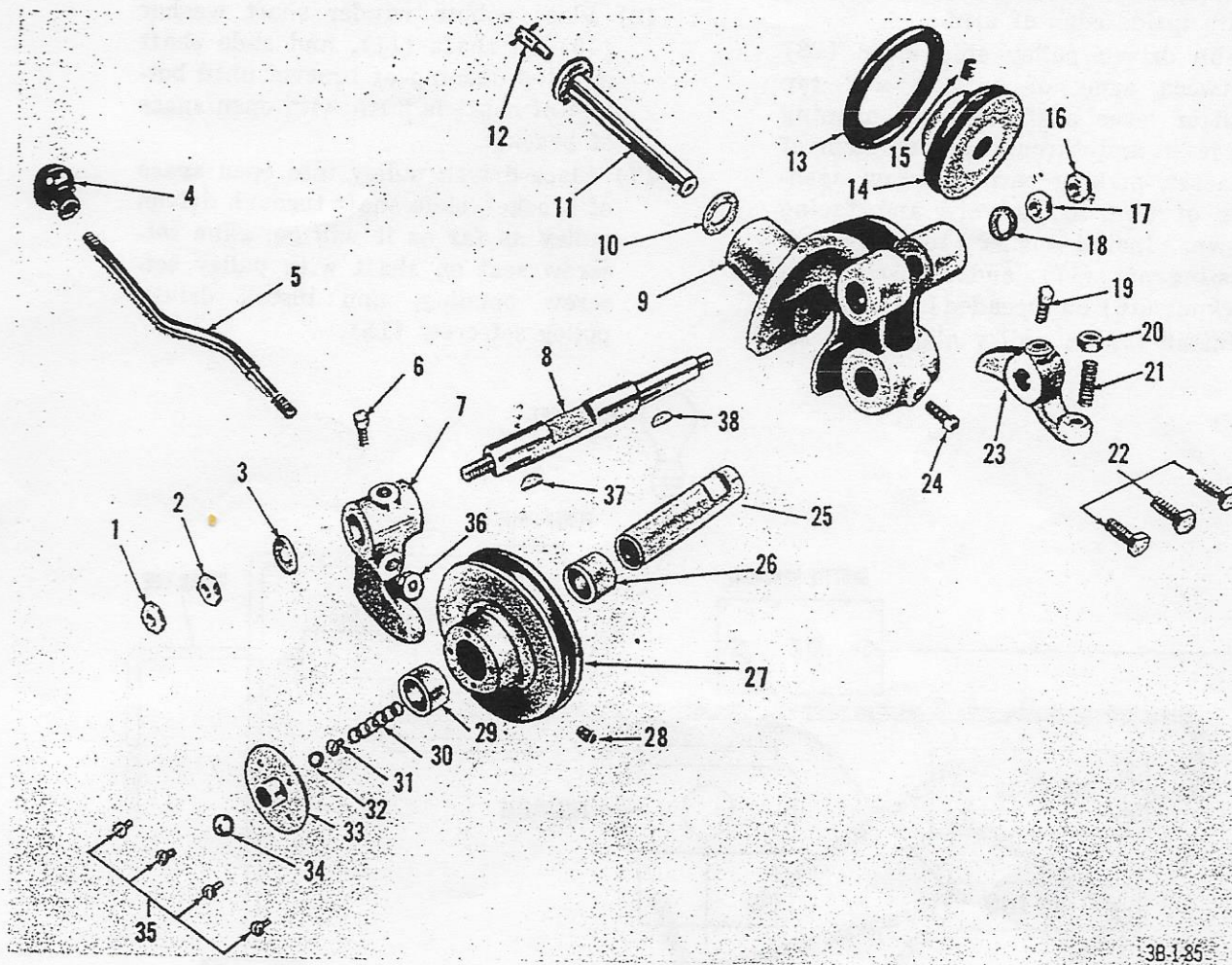
Figure 84. Presserfoot release treadle assembly installed.

ed end of shaft is exposed, and install washer (3), large tension nut (2), and tension nut locknut (1) on threaded end of shaft. Fingertighten nuts.

(10) Install shifter lever retaining screw

(6), fingertight, into screw hole of shifter lever.

(11) Fit idler pulley and shaft into rear opening of bracket (9) until shaft is flush at other end of opening, and screw seat on shaft faces hole in side



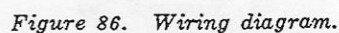
38-1-85

- | | |
|--|---|
| 1 Shifter lever shaft tension nut locknut | 20 Driven pulley stop lever stop screw nut |
| 2 Shifter lever shaft tension nut, large | 21 Driven pulley stop lever stop screw |
| 3 Shifter lever shaft tension nut washer | 22 Hexagon head machine bolts |
| 4 Shifter handle knob | 23 Driven pulley stop lever |
| 5 Shifter handle | 24 Idler pulley shaft retaining screw |
| 6 Shifter lever retaining screw | 25 Idler pulley shaft |
| 7 Shifter lever | 26 Idler pulley bearing |
| 8 Shifter lever shaft | 27 Idler pulley |
| 9 Bracket | 28 Idler pulley bearing setscrew |
| 10 Shaft washer | 29 Idler pulley bearing |
| 11 Shaft | 30 Idler pulley spring |
| 12 Shaft stud with bobbin winder drive pin | 31 Idler pulley pressure plug |
| 13 Driven pulley rubber tire | 32 Idler pulley pressure plug steel ball |
| 14 Driven pulley | 33 Idler pulley thrust plate |
| 15 Driven pulley setscrew | 34 Idler pulley thrust plate steel ball |
| 16 Shifter lever shaft adjusting nut locknut | 35 Idler pulley thrust plate retaining screws |
| 17 Shifter lever shaft adjusting nut, large | 36 Shifter handle nut |
| 18 Shifter lever shaft adjusting nut washer | 37 Woodruff key |
| 19 Driven pulley stop lever retaining screw | 38 Woodruff key |

Figure 85. Bobbin winder, exploded view.

- (12) Fit woodruff key (38) into key seat on shifter lever shaft, and fit lever and shaft into left arm of front opening of bracket until end of shaft is flush with inside edge of arm.
- (13) Slip driven pulley stop lever (23) between arms of bracket and tap shifter lever shaft through opening in lever and through second arm of bracket, making certain screw opening of lever is forward and facing down. Install washer (18), large adjusting nut (17), and adjusting nut locknut (16) on threaded end of shaft.
- (14) Install driven pulley stop lever re-

- (15) Slip driven pulley rubber tire (13) on rim of driven pulley (14).
- (16) Place bobbin winder shaft washer (10) on shaft (11), and slide shaft into top opening of bracket until bottom of shaft is flush with open space of bracket.
- (17) Place driven pulley into open space of bracket, slide shaft through driven pulley as far as it will go, align setscrew seat on shaft with pulley setscrew opening, and install driven pulley setscrew (15).



- (18) Install shaft stud (left-hand thread) with bobbin winder drive pin (12) into top of shaft.
- (19) Place assembled bobbin winder (fig.

81) on stitcher head frame from below, and fit hexagon head machine bolts (22, fig. 85) into boltholes in stand.

Section V. HEATING SYSTEM

70. Description

a. The heating system of the sole stitching machine consists of three flat, conduction type heat units. One is attached to the shuttle head (fig. 77). The other 2 are attached to the auxiliary takeup bracket (fig. 32), 1 for bracket and thread rolls, and the other for the wax pot.

b. These heat units are thermostatically controlled (par. 20) and the wiring is connected in parallel to operate at 110 volts.

- (1) The current for the takeup bracket heat unit (110 volts) passes through a manually operated starting switch to a unit block, then to the bracket unit, and finally to the thermostat to complete the circuit.

- (2) The current for the wax pot unit (48 volts) passes through the starting switch and then to the unit block. From the unit block the current goes to the wax pot heat unit and, bypassing the takeup bracket unit, to the shuttle heat unit, from which it returns to the unit block and then to the thermostat to complete the circuit.

71. Installation

Heating units, control panel, and thermostat are installed as prescribed by paragraph 65a(11) through (17) and (249) through (255). A wiring diagram appears as figure 86.